

Code No: K0121 /R07

R07**Set No.1**

IV B.Tech II Semester Supplementary Examinations, July, 2011

ADVANCED STRUCTURAL DESIGN**(Civil Engineering)****Time: 3 hours****Max. Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. Design a cantilever type retaining wall to retain earth embankment with a horizontal top 3.5 m above the ground level. Unit weight of earth = 18 kN/m^3 . Angle of internal friction = 30° . Safe bearing capacity of soil = 200 kN/m^2 . Friction coefficient between soil and concrete = 0.50. M20 concrete and Fe415 steel are to be adopted.
2. Design a circular water tank with flexible base resting on the ground to store 50,000 liters of water. The depth of the tank is to be kept as 4 m. M30 concrete and Fe415 steel are to be adopted.
3. Design side walls and hopper bottom of a rectangular bunker of capacity 310 kN to store coal of unit weight 8 kN/m^3 . M20 concrete and Fe415 steel are to be adopted.
4. Design bottom plate, T-covers, side plate and upper tier of beams for an elevated rectangular water tank to store 1 lakh liters of water. The height of staging is 15 m. The columns are to be supported on concrete pedestals. Bearing stress in concrete = 4 MPa. SBC of soil = 120 kN/m^2 .
5. Design an RCC slab culvert for the following data.

Clear span	= 5 m
Width of supports	= 400 mm
Clear width of road way	= 6.8 m
Width of kerbs	= 600 mm
Wearing coat	= 80 mm thick
Loading	= Class A
6. Design a plate girder for an effective S.S.span of 18 m. The super imposed load on the girder consists of udl of 50 kN/m excluding its own weight and two concentrated loads of 500kN at one –third points of span. Sketch the girder.

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7. Design a foot-bridge using trusses for an effective span of 21 m. The clear width is 2.5m. The flooring consists of timber planks. Take the live load as 4 kN/m^2 . Assume suitable data wherever necessary.
8. Design a beam AB is to be designed for the following moments. $M_A = -69 \text{ kN-m}$ and $+23 \text{ kN-m}$ and $M_B = -88 \text{ kN-m}$ and $+3 \text{ kN-m}$. The characteristic dead and live loads are 10 and 5 kN/m respectively. The span is 6 m, beams are 300 mm x 500 mm with 150 mm thick slab. M20 concrete and Fe415 steel are to be adopted. The structure is located in seismic zone-IV. Design should be as per IS 13920-1993.

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ADVANCED STRUCTURAL DESIGN

(Civil Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

- Design a cantilever type retaining wall to retain earth embankment with a horizontal top 3.3 m above the ground level. Unit weight of earth = 18 kN/m^3 . Angle of internal friction = 30° . Safe bearing capacity of soil = 190 kN/m^2 . Friction coefficient between soil and concrete = 0.50. M25 concrete and Fe415 steel are to be adopted.
- Design a rectangular water tank of size 5 m x 4 m x 3 m deep resting on firm ground. M30 concrete and Fe415 steel are to be adopted.
- A silo with internal diameter 5.5 m, cylindrical portion of 18 m height and central opening 0.5 m is to store wheat of unit weight 8.5 kN/m^3 . Design the silo adopting M25 concrete and Fe415 steel for the data as follows.
 - Angle of internal friction = 30°
 - Angle of wall friction = 0.75ϕ while filling
 - = 0.60ϕ while emptying
 - Pressure ratio = $p_h / p_v = K = 0.5$ while filling.
 - Use Janssen's theory for pressure calculations.
- Design an elevated pressed steel tank having a capacity of 1.25 lakh liters. The height of staging is 15 m.
- Design the deck slab of an RCC T-beam girder bridge for the following data.
 - Clear width of road way = 7.5 m
 - Span (c/c of bearings) = 16 m
 - Width of supports = 400 mm
 - Width of kerbs = 600 mm
 - Wearing coat = 80 mm thick
 - Loading = IRC Class A
 - M25 concrete and Fe415 steel are to be adopted.

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R07**Set No.2**

6. Design a gantry girder for a mill building to carry an electric overhead travelling crane, having the following data.

Crane capacity	= 250 kN
Weight of crane excluding crab	= 200 kN
Weight of crab	= 60 kN
Span of crane between rails	= 15 m
Minimum hook approach	= 1.2 m
Wheel base	= 3.5 m
Span of gantry girder	= 6 m
Weight of rail section	= 0.3 kN/m
Height of rail section	= 75 mm
Take $f_y = 250 \text{ N/mm}^2$ and $E = 2 \times 10^5 \text{ N/mm}^2$.	

7. Design stringers and cross-girders of a through type truss girder bridge to carry a single track B.G. loading for the following data.

Effective span	= 39 m
C/c spacing of stringers	= 1.9 m
Sleepers and spacing	= 250 mm x 150 mm x 2.8 m @ 0.40 m c/c
Density of timber	= 7.4 kN/m^3
Density of stock rails	= 0.44 kN/m
Weight of guard rails	= 0.26 kN/m
Weight of fastenings etc.,	= 0.28 kN/m of track.

8. A block of 10 storeyed apartment in Chennai has its lowermost column 500 mm x 700 mm in size. In order to use the ground floor for parking, lower columns are made free standing. Comment on the considerations to be given for detailing of these freestanding columns. M20 concrete and Fe415 steel are to be adopted. Height of free bay is 4 m.

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R07**Set No.3**

IV B.Tech II Semester Supplementary Examinations, July, 2011

ADVANCED STRUCTURAL DESIGN

(Civil Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Design a counterfort type retaining wall to retain earth if the height of the wall 5.5 m above the ground level. Unit weight of backfill = 18 kN/m^3 . Angle of internal friction = 30° . Safe bearing capacity of soil = 180 kN/m^2 . Maintain spacing of counterforts as 3 m. Friction coefficient between soil and concrete = 0.50. M20 concrete and Fe415 steel are to be adopted.
2. Design bottom slab and walls of an under-ground water tank of size 3 m x 8 m x 3 m for the data given below.
 - Type of soil :Submerged sandy soil with $\gamma_s = 16 \text{ kN/m}^3$ and $\phi=30^\circ$.
 - Water table can rise upto ground level.
 - M30 concrete and Fe415 steel are to be adopted.
3. Design a chimney of height 70 m and check the stresses in steel bars for the following data.
 - External diameter = 4 m at top and 4.8 m at base
 - Shell thickness = 200 mm at top and 400 mm at base
 - Wind load = 1.75 kN/m^2 throughout.
 - Fire brick lining thickness = 100 mm
 - Air gap = 100 mm
 - Temperature difference = 70°C
 - Coefficient of thermal expansion = $11 \times 10^{-6}/^\circ\text{C}$
 - $E_s = 210 \times 10^3 \text{ N/mm}^2$
 - Unit weight of lining = 20 kN/m^3
 - M25 concrete and Fe415 steel are to be adopted.
4. A cylindrical steel tank with hemispherical bottom is required to store 1.2 lakh liters of water. Design the following.
 - a. The cylindrical plate
 - b. The horizontal seams
 - c. The vertical joint
 - d. The connection between hemispherical bottom and cylinder.

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5. Design an RCC slab culvert for the following data.

Clear span	= 5.5 m
Width of supports	= 400 mm
Clear width of road way	= 7 m
Width of kerbs	= 600 mm
Wearing coat	= 75 mm thick
Loading	= Class A

6. Design a plate girder for an effective S.S.span of 20 m. The super imposed load on the girder consists of udl of 45 kN/m excluding its own weight and two concentrated loads of 500 kN at one –third points of span. Sketch the girder.

7. Design a foot-bridge using trusses for an effective span of 18 m. The clear width is 2.5 m. The flooring consists of timber planks. Take the live load as 4 kN/m². Assume suitable data wherever necessary.

8. Design a beam AB is to be designed for the following moments. $M_A = -71$ kN-m and $+25$ kN-m and $M_B = -87$ kN-m and $+4$ kN-m. The characteristic dead and live loads are 10 and 4 kN/m respectively. The span is 5 m, beams are 300 mm x 500 mm with 150 mm thick slab. M20 concrete and Fe415 steel are to be adopted. The structure is located in seismic zone-IV. Design should be as per IS 13920-1993.

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R07**Set No.4**

IV B.Tech II Semester Supplementary Examinations, July, 2011

ADVANCED STRUCTURAL DESIGN

(Civil Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

- Design a counterfort type retaining wall to retain earth if the height of the wall 5.8 m above the ground level. Unit weight of backfill = 18 kN/m^3 . Angle of internal friction = 30° . Safe bearing capacity of soil = 200 kN/m^2 . Maintain spacing of counterforts as 3.5 m. Friction coefficient between soil and concrete = 0.50. M25 concrete and Fe415 steel are to be adopted.
- A flat bottom circular elevated water tank of diameter 10 m and total height 4 m is to be supported by ring beam of 7.5 m diameter. The ring beam is to be supported by six columns equally placed. Design the top dome and top ring beam if M30 concrete and Fe415 steel are adopted.
- Briefly explain the procedure adopted in the design of chimney giving typical cross-section showing details of steel.
- Design bottom plate, T-covers, side plate and upper tier of beams for an elevated rectangular water tank to store 1.25 lakh liters of water. The height of staging is 15 m. The columns are to be supported on concrete pedestals. Bearing stress in concrete = 4 MPa. SBC of soil = 120 kN/m^2 .
- Design longitudinal girders of an RCC T-beam girder bridge for the following data.

Clear width of road way	= 7.5 m
Span (c/c of bearings)	= 16 m
Width of supports	= 400 mm
Width of kerbs	= 600 mm
Wearing coat	= 80 mm thick
Loading	= IRC Class A

 M25 concrete and Fe415 steel are to be adopted.

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R07**Set No.4**

6. Design a gantry girder for a mill building to carry an electric overhead travelling crane, having the following data.

Crane capacity	= 250 kN
Weight of crane excluding crab	= 200 kN
Weight of crab	= 60 kN
Span of crane between rails	= 16 m
Minimum hook approach	= 1.5 m
Wheel base	= 3.5 m
Span of gantry girder	= 5 m
Weight of rail section	= 0.3 kN/m
Height of rail section	= 75 mm
Take $f_y = 250 \text{ N/mm}^2$ and $E = 2 \times 10^5 \text{ N/mm}^2$.	

7. Design stringers and cross-girders of a through type truss girder bridge to carry a single track B.G. loading for the following data.

Effective span	= 40 m
C/c spacing of stringers	= 2 m
Sleepers and spacing	= 250 mm x 150 mm x 2.8 m @ 0.40 m c/c
Density of timber	= 7.4 kN/m^3
Density of stock rails	= 0.44 kN/m
Weight of guard rails	= 0.26 kN/m
Weight of fastenings etc.,	= 0.28 kN/m of track.

8. A block of 10 storeyed apartment in Chennai has its lowermost column 500 mm x 700 mm in size. In order to use the ground floor for parking, lower columns are made free standing. Comment on the considerations to be given for detailing of these freestanding columns. M25 concrete and Fe415 steel are to be adopted. Height of free bay is 5 m.

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Set No.1

IV B.Tech II Semester Supplementary Examinations, July, 2011
GROUND WATER DEVELOPMENT AND MANAGEMENT
(Civil Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Explain sub surface water distribution with a neat sketch.
b) What is artesian aquifer? Explain.
2. Distinguish between permeability and transmissibility? Describe how the permeability is determined in field?
3. a) What are the assumptions made in Dupit's Theory for the discharge from a well in an unconfined aquifer?
b) A well penetrates into an unconfined aquifer having a saturated depth of 100m. The discharge is 250 liters per minute at 12m drawdown. Assuming equilibrium flow conditions and a homogeneous aquifer estimate the discharge at a drawdown of 18m. The radii of influence in both the cases may be taken as equal.
4. Explain Chow's method of determining hydraulic properties of the aquifers through pumping test?
5. a) Explain electrical resistivity method carried out for groundwater exploration?
b) Explain how remote sensing is used for sub surface investigations of groundwater?
6. What is the purpose artificial recharge of groundwater? Explain the use of remote sensing for the steady of artificial recharge of groundwater?
7. a) List out the various reasons for the occurrence of saline water intrusion?
b) Explain the relation between fresh and saline water?
8. Discuss the concepts of basin management and explain any case study illustrating groundwater basin management?

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Set No.2

IV B.Tech II Semester Supplementary Examinations, July, 2011
GROUND WATER DEVELOPMENT AND MANAGEMENT
(Civil Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Define safe yield. Explain the various factors affecting it?
b) Explain the various methods of assessment of safe yield of an Aquifer?
2. a) What is Darcy's law applied for ground water flow?
b) A confined aquifer has a transmissivity of $40 \text{ m}^2/\text{day}$. The slope of the piezometric surface is 0.25 m/km . How much water per day flows through the aquifer for KM width of the aquifer?
3. Derive the expression for the discharge from a well in an unconfined aquifer based on the Dupit's Theory. Explain the assumption made clearly.
4. Define well losses. Explain how they are retained?
5. a) Explain surface investigations used for ground water exploration.
b) Explain how aerial photogrammetry is used for sub surface investigations of groundwater?
6. Explain the use of remote sensing for the study of artificial recharge of ground water?
7. a) Discuss Ghyben- Herzberg relation between fresh and saline water?
b) Discuss the structure of fresh – salt water interference?
8. Give a note on basin management by conjunctive use with the help of any case study?

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R07

Set No.3

IV B.Tech II Semester Supplementary Examinations, July, 2011
GROUND WATER DEVELOPMENT AND MANAGEMENT
(Civil Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Explain the various methods of assessment of safe yield of an aquifer?
b) Distinguish between confined aquifer and unconfined aquifer?
2. a) State Darcy's law. State the limits of its applicability.
b) Distinguish clearly between permeability and transmissibility.
Describe how permeability is determined in the field?
3. Derive the equation for the discharge of a steady flow in a confined aquifer?
4. Discuss Theis non-equilibrium formula use for the determination of aquifer properties by means pumping test of wells?
5. a) Distinguish between surface and sub surface investigations applied for ground water exploration.
b) Explain how remote sensing is used for sub surface investigations of groundwater?
6. Explain the concept of artificial recharge and discuss any case study of application of remote sensing and GIS in artificial recharge of ground water?
7. a) List out the various reasons for the occurrence of saline water intrusion?
b) Explain about the shape of the fresh – salt water interface?
8. Give a note on basin management by conjunctive use with the help of any case study?

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Set No.4

IV B.Tech II Semester Supplementary Examinations, July, 2011
GROUND WATER DEVELOPMENT AND MANAGEMENT
(Civil Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Explain specific yield, storage co-efficient of water bearing formation?
What is the specific capacity of an ordinary perfect well?
2. a) State Darcy's law. When is it applicable?
b) Describe how permeability is determined in the field?
3. Explain about analysis of pumping test data of wells for the determination of aquifer properties?
4. Explain Chow's method of determining hydraulic properties of the aquifers through pumping test?
5. a) Explain method of geophysical logging used for ground water exploration?
b) Explain how remote sensing is used for sub surface investigations of groundwater?
6. Explain the concept of artificial recharge and discuss any case study of application of remote sensing and GIS in artificial recharge of ground water?
7. a) What is upconing of saline water?
b) Discuss the structure of fresh – salt water interference?
8. a) Give a note on basin management by conjunctive use.
b) Explain data collection & field work for ground water basin investigations?

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R07

Set No.1

IV B.Tech II Semester Supplementary Examinations, July, 2011
ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT
(Civil Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Define EIA. Explain the guiding principles of EIA.
b) What are the factors affecting the EIA impact evaluation and analysis?
2. a) List the impact identifications methods of EIA. Explain check list method.
b) Explain the Leopold interaction matrix method of EIA
3. a) What is the significance of delineation of study area?
b) Write the methodology for assessment of soil characteristics in the study area.
4. a) How the impacts on surface water environment are assessed in an EIA process?
b) What are the factors that should be taken into account in the mitigation of impact on biological environment?
5. a) What is deforestation? List the causes and effects of deforestation.
b) What are the impacts of developmental activity on vegetation?
6. a) Define Environmental Audit. What are the types of environmental audits?
b) What are the salient features of Water (Prevention and Control of Pollution) Act?
7. a) Mention the components of environmental audit? Describe each in brief.
b) What are the salient features of Environmental Pollution (Protection) Act, 1986?
8. Explain in brief the EIA of a thermal power plant.

Code No: K0123 /R07

R07

Set No.2

IV B.Tech II Semester Supplementary Examinations, July, 2011
ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT
(Civil Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) What are the elements of EIA process? Briefly explain the elements of EIA process.
b) List the factors that influence the EIA impact evaluation and analysis?
2. a) What are the impact identifications methods of EIA? Explain adhoc method
b) Explain the network method of EIA.
3. What is land use land cover pattern? How it will be useful in the process of EIA of a developmental activity?
4. a) Write the advantages and disadvantages of various EIA identification methods
b) What are the factors that should be taken into account in the mitigation of impact on air environment?
5. a) Which measures will be useful to mitigate the impact of deforestation on environment?
b) What are the impacts of developmental activity on wildlife?
6. a) Define Environmental Audit. What are the stages involved in the environmental audits?
b) What are the salient features of Air (Prevention and Control of Pollution) Act?
7. a) Explain briefly the procedure for reviewing EIA
b) What are the salient features of Environmental Pollution (Protection) Act, 1986?
8. Explain briefly the salient features in preparation of EIA of a large dam across a river.

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R07

Set No.3

IV B.Tech II Semester Supplementary Examinations, July, 2011
ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT
(Civil Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Draw flow charts showing the major steps to be taken in carrying out the EIA process.
b) Describe the preparation of environmental base map in an EIA process?
2. a) List the impact identifications methods of EIA. Explain adhoc method.
b) Explain the advantages and disadvantages of matrix method and overlay method in EIA process
3. a) What are the impacts of mining activity on ground water quality?
b) List the activities to be taken into consideration in the assessment impacts of soil characteristics in the study area due to a fertilizer industry.
4. a) List the sources of air pollution? How the air pollution impact is assessed in an EIA process?
b) Explain the framework and principles of impact mitigation in the EIA process
5. a) What is deforestation? What are the impacts of deforestation on environment?
b) How do you assess the impacts of development activities on wild life?
6. a) Explain the elements of an effective environmental audit program?
b) What are the salient features of Environmental Pollution (Protection) Act, 1986?
7. a) What do you mean by audit protocol? How the environmental audit is evaluated.
b) What are the salient features of wild life act?
8. Explain in brief the EIA of a Nuclear energy plant.

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R07

Set No.4

IV B.Tech II Semester Supplementary Examinations, July, 2011
ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT
(Civil Engineering)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Define EIA. Explain the core values of an EIA.
b) How do you assess the significance of any impact in EIA process?
2. a) List the impact identifications methods of EIA. Explain checklist method.
b) Explain the advantages and disadvantages of matrix method over checklist method in EIA process
3. a) What is the significance of delineation of study area?
b) Write the methodology for assessment of ground water characteristics in the study area.
4. a) What is significance of environmental settings in a EIA study?
b) Explain the framework and principles of impact mitigation in the EIA process
5. a) What is deforestation? What are the causes of deforestation?
b) How do you assess the impacts of development activities on wild life?
6. a) What is environmental audit? What are the various onsite activities of environmental audit?
b) What are the steps involved in the preparation of Environmental Audit report?
7. a) What are the powers and functions of state pollution control boards as per Water act 1974?
b) What are the salient features of Environmental Pollution (Protection) Act, 1986?
8. Explain in brief the EIA of an oil (petroleum) refinery industry.

Code No: K0221 /R07

R07**Set No.1**

IV B.Tech II Semester Supplementary Examinations, July, 2011

UTILISATION OF ELECTRICAL ENERGY**(Electrical and Electronics Engineering)****Time: 3 hours****Max. Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. Compare the running characteristics of a 3-phase Induction motor of similar rating with: (i) Slip Ring Motor (ii) Squirrel Cage Motor. [8+8]
2. a) Give relative advantages and disadvantages of direct and indirect electric arc furnaces.
 b) Explain the principle of Induction heating. What are the applications of induction heating? [8+8]
3. a) Describe with neat sketches, various methods of electric resistance welding.
 b) What are the important components of DC and AC welding sets and explain their functions. [8+8]
4. a) A lamp having a uniform candle power of 200 in all directions is provided with a reflector which directs 60 % of total light uniformly on to a circular area of 10 m diameter. The lamp is hung 6 meters above the area. Calculate the illumination (i) at the center (ii) at the edge of the surface with and without the reflector. Determine also the average illumination over the area without reflector.
 b) What is an integrating sphere? Explain its use in illumination engineering. [8+8]
5. Describe the working and construction of filament lamp. Compare it with florescent lamp. [16]
6. a) What are the requirements of good electric braking?
 b) Explain the method of rheostatic braking. [6+10]
7. With the help of complete speed time curve, discuss how different parameters of this curve change with the type of train service. [16]
8. a) What is coefficient of adhesion? How does it affect slipping of the driving wheel of a traction unit?
 b) Derive an expression for tractive effort for a train on a level track. [9+7]

Code No: K0221 /R07

R07**Set No.2**

IV B.Tech II Semester Supplementary Examinations, July, 2011

UTILISATION OF ELECTRICAL ENERGY**(Electrical and Electronics Engineering)****Time: 3 hours****Max. Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. a) Discuss the advantages and disadvantages of electric drive over other drives.
 b) A 220 V, 10 h.p. (metric) shunt motor has field and armature resistances of 120 Ohms and 0.25 Ohm, respectively. Calculate the resistance to be inserted in the armature circuit to reduce the speed to 700 r.p.m. from 950 r.p.m, if the full load efficiency is 80% and the torque varies as the square of the speed. [8+8]
2. a) With a neat sketch explain the working principle of core less type induction furnace.
 b) An electric arc furnace consuming 5 kW takes 15 minutes to just melt 1.5 Kgs of aluminum, the initial temperature being 15°C. Find the efficiency of the furnace. Specific heat of aluminum is 0.212, melting point 658°C and latent heat of fusion is 76.8 Cal per gram. [8+8]
3. a) Draw a neat sketch of a spot welding machine and describe its construction and working in detail.
 b) Compare DC and AC welding. [8+8]
4. a) State and explain about the laws of Illumination. Derive the relation between E, L and I for a uniform diffused source.
 b) A lamp fitted with 120 degrees angled cone reflector illuminates circular area of 200 meters in diameter. The illumination of the disc increases uniformly from 0.5-meter-candle at the edge to 2- meter-candle at the centre. Determine (i) the total light received (ii) Average illumination of the disc (iii) Average candlepower of the source. [8+8]
5. a) What do you understand by discharge lamp? Explain the construction and working of high-pressure mercury lamp.
 b) Prove that in a filament lamp the diameter of the filament is directly proportional to $I^{2/3}$, where I is the current flowing in the filament. [8+8]
6. a) What are the advantages and disadvantages of track electrification.
 b) Explain how rheostatic braking is done in D.C. shunt motors and series motors. [8+8]

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7. a) Write a short note on mechanics of train movement.
b) Explain the speed time curve for a main line service and derive the expression

$$\frac{1}{2} \left[\frac{1}{\alpha} + \frac{1}{\beta} \right] = \frac{3600D}{V_m^2} \left[\frac{V_m}{V_a} - 1 \right], \text{ where the symbols have their usual meaning.}$$

[8+8]

8. a) Describe the procedure for calculating the specific energy consumption of an electric train.
b) What is tractive effort of a train and what are its functions? [10+6]

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R07

Set No.3

IV B.Tech II Semester Supplementary Examinations, July, 2011

UTILISATION OF ELECTRICAL ENERGY

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 80

**Answer any FIVE Questions
All Questions carry equal marks**

1. Give with reasons the type of application for which the following motors are best suited: (i) DC shunt motor (ii) DC Series motor (iii) Synchronous motor (iv) 3-phase Induction Motor [4x4=16]
2. a) What are the various types of induction furnace? Describe one of them with a neat sketch.
b) What is the method by which pinch effect in direct core type of induction furnace has been eliminated? [8+8]
3. a) What are the various methods of electric welding?
b) Describe briefly the various types of arc welding processes used in industry. [8+8]
4. Define the following terms: [8x2=16]
 - i. Lumen
 - ii. Mean spherical Candlepower
 - iii. Luminance
 - iv. Mean horizontal Candlepower
 - v. Mean hemispherical Candlepower
 - vi. Luminous flux
 - vii. Illumination
 - viii. Luminous intensity
5. a) Discuss the flood lighting with suitable diagrams.
b) Explain with sketches the constructional features of a florescent lamp. [8+8]
6. a) Discuss about electric traction system in India. How it is different from distribution system.
b) Explain the requirements of ideal traction and show which drive satisfies almost all the requirements. [8+8]

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7. a) For a quadrilateral speed-time curve of an electric train, derive expression for the distance between stops and speed at the end of the coasting period.
b) The speed-time curve of a train consists of (i) Uniform acceleration of 5 km/hr/s for 26 seconds; (ii) free running for 9 minutes; (iii) Uniform deceleration of 5 km/hr/s to stop the train; (iv) A stop of 4 minutes.
Find the distance between stations, the average, and scheduled speeds. [8+8]
8. a) Explain the terms 'dead weight', 'effective weight' and adhesive weight in a locomotive.
b) Derive an expression for the tractive effect developed by a train unit. [8+8]

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Set No.4

IV B.Tech II Semester Supplementary Examinations, July, 2011

UTILISATION OF ELECTRICAL ENERGY

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 80

**Answer any FIVE Questions
All Questions carry equal marks**

1. a) Discuss the various factors that govern the choice of a motor for a given service.
b) A 6 pole, 50 Hz slip ring induction motor with a rotor resistance per phase of 0.2 Ohm and a standstill reactance of 1.0 Ohm per phase runs at 960 r.p.m. at full load. Calculate the resistance to be inserted in the rotor circuit to reduce the speed to 800 r.p.m., if the torque remains unaltered. [8+8]
2. a) What are the applications of high frequency eddy current heating? Also explain the principle of high frequency eddy current heating.
b) Discuss various methods of temperature control in the resistance heating. [8+8]
3. a) What are the advantages and disadvantages of electric welding process?
b) Draw a neat sketch of a spot welding machine and describe its construction and working in detail. [8+8]
4. a) What are polar curves? How it is useful to an illumination engineer ?
b) A small light source with intensity uniform in all directions is mounted at a height of 10 meters above a horizontal surface. Two points A and B both lie on the surface with point A directly beneath the source. How far the point B from the point A if the illumination at point B is only 1/10 as great as at point A. [8+8]
5. a) Explain with connection diagram the operation of the low-pressure fluorescent lamp and state its advantages.
b) What are the various types of lighting schemes? Explain with relevant diagrams. [8+8]
6. a) Briefly discuss the special design features of traction motor.
b) Describe how plugging and rheostatic braking are employed with DC motors. [8+8]

Code No: K0221 /R07

R07

Set No.4

7. a) Draw the speed-time curve of a main line service and explain how it works.
b) A train has a scheduled speed of 55 km/hr between two stops, which are 7 km apart. Determine the crest speed over the run, if the duration of stops is 70 sec and acceleration and retardation both are 4 km/hr/sec each. Assume simplified trapezoidal speed-time curve. [8+8]
8. a) Explain specific energy output and specific energy consumption.
b) A 400 tonne goods train is to be hauled by a locomotive up a gradient of 2% with acceleration of 1 km/hr/sec, coefficient of adhesion 20%, track resistance 40 newtons/tonne and effective rotating masses 10% of the dead weight. Find the weight of the locomotive and the number of axles if the axle load is not to increase beyond 22 tonnes. [8+8]

FirstRanker

Code No: K0321/R07

Set No. 1

IV B.Tech II Semester Supplementary Examinations, July 2011
PRODUCTION PLANNING AND CONTROL
(Mechanical Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. For producing right quantity, right quality, at right time PPC functions are essential. You contradict or accept. If so, Justify your convention. [16]
2. (a) What is forecasting?
(b) Explain importance of forecast. [16]
3. (a) Explain the inventory structure.
(b) Illustrate the objectives of inventory control. [16]
4. One unit of product Z is made from one unit of A and two units of B. A is made from two units of C and one unit D. B is made from three units of E, one unit of F and two units of G. Items Z, A, D, E, F and G have lead times of one week; items B and C have lead times of two weeks. Items Z, A, B,D and F are made by the company and items C,E and G are purchased . The gross requirement for product Z during the next 10 weeks are 100units in week 5, 200 in week 7, 400 in week 8 and 150 in week 10. Also suppose the company expects to have 20 units of A, 60 units of E and 50 units of G on hand at the beginning of week 1 and no units of the other items on hand. Construct the material requirements plans for product Z and A and B using lot-for lot procurement. [16]
5. Why the worksheets are prepared ? Give an example of worksheet. [16]
6. What is prioritization in scheduling? Explain. [16]
7. The following list defines the precedence relationships and element times for a component:

Element	Processing time (min)	Immediate predecessors
1	0.5	-
2	0.3	1
3	0.8	1
4	0.2	2
5	0.1	2
6	0.6	3
7	0.4	4,5
8	0.5	3,5
9	0.3	7,8
10	0.6	6,9

Code No: K0321/R07

Set No. 1

The estimated cycle time is 1 min. What is the theoretical number of workstations required to minimize the balance the delay? Also find the practical number of work centers using the Ranked positional method. [16]

8. What do you understand by reporting and why it is required? Explain [16]

FirstRanker

Code No: K0321/R07

Set No. 2

IV B.Tech II Semester Supplementary Examinations, July 2011
PRODUCTION PLANNING AND CONTROL
(Mechanical Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. What are the advantages of production planning and control? [16]
2. Forecast the production for next two years when the production quantity for last ten years is as follows:
 200,225,235,240,255,260,265,275,270,271
 Use the following methods and comment on results:
 - (a) Simple average
 - (b) Moving average (3 years and 5 years)
 - (c) Exponential smoothing for $\alpha = 0.3$ and 0.7 . [16]
3. DAT Inc produces a digital audiotapes to be used in the consumer audio division. DAT lacks sufficient personnel in its inventory supply section to closely control each item stocked so assume that it has asked to you to determine an ABC classification. Here is a sample from the from the inventory:

Item no	1	2	3	4	5	6	7	8	9	10
Annual use	700	200	2000	1100	4000	100	3000	2500	500	1000
Price	6	4	12	20	21	10	2	1	10	2

Develop an ABC classification for these 10 items. [16]

4. A company manufactures product Z using four basic components and performing two additional machining operations and three assembly operations. Components A and C are made by the company and components B and D are purchased from vendors. The BOM for product Z is given below:

Level No	Item description	No.Of required	Make/buy	Lead time
00	Product Z		Make	1 Week
01	Assembly F	1	Make	1 Week
02	Machined E	1	Make	2 Weeks
03	Component A	1	Make	2 Weeks
02	Fastener B	2	Buy	2 Weeks
01	Machined G	2	Make	1 Week
02	Assembly C	1	Make	3 Weeks
01	Assembly H	2	Make	1 Week
02	Component A	1	Make	2 Weeks
02	Component D	3	Buy	4 Weeks
01	Fastener B	4	Buy	2 Weeks

The product is made as follows:

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- (a) a unit of component A is machined and converted into component E
 (b) a unit of E is then assembled with two units of B to make F
 (c) a unit of C is machined and converted into G
 (d) a unit of A and three units of H and four units of B are then assembled into product Z:
- i. Construct product structure tree for product Z
 - ii. Construct a product time chart for product Z. [16]
5. A machine operator processes four types of products and must choose sequence for them. The set-up cost per change (Rs.) depends on the products presently on the machine and the set-up be made according to the following table:

From product	To product			
	A	B	C	D
A	-	4	7	3
B	4	-	6	3
C	7	6	-	7
D	3	3	7	-

How should one sequence the products in order to have minimum total set-up cost? [16]

6. Write a note on the use of computers for scheduling. [16]
7. What is Line balancing? Explain why is required in Continuous flow production systems? [16]
8. Differentiate between dispatching and expediting and point out to what extent these differences should lead to a clear and rigid demarcation of responsibilities between dispatching and expediting. [16]

Code No: K0321/R07

Set No. 3

IV B.Tech II Semester Supplementary Examinations, July 2011
PRODUCTION PLANNING AND CONTROL
(Mechanical Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. What do you mean by control phase? What are activities of under this phase? Explain them in brief. [16]
2. Alpha company has the following sales pattern during 1988 to 1996. Compute the sales forecast for 1997: [16]

Year	1988	1989	1990	1991	1992	1993	1994	1995	1996
Sales in lakhs	6	8	11	23	29	34	40	45	56

3. Explain the basis of selective inventory control and explain the different (at least two) selection techniques adopted in an inventory control system. [16]
4. Product A consists of three B type of sub-assemblies and one C type of subassembly. The B consists of one D, one E sub-assembly, and one F. The sub-assembly C consists of a G and an F. The sub-assembly E consists of a D and a K:
 - (a) Prepare a product tree
 - (b) Prepare the indented BOM
 - (c) Determine number of each sub-assembly/components required to produce fifty A. [16]
5. How do you determine the optimal sequence of manufacturing operations in routing? Explain with an example. [16]
6. Describe the following scheduling procedures with their relative advantages and disadvantages:
 - (a) Shortest Processing Time (SPT)
 - (b) Due Date (DD) and
 - (c) Least slack time first (LS) [16]
7. A manufacturer of containers employed a Linear Decision Rule model to derive two decision rules for setting quarterly production rates and work force levels. These rules are

$$P_t = 0.5S_t + 0.3S_{t+1} + 0.1S_{t+2} - 0.5S_{t+3} + 1.5W_{t-1} - 0.5I_{t-1} + 150$$

$$W_t = 0.1W_{t-1} + 5 - 0.01I_{t-1} + 0.1S_t + 0.05S_{t+1} + 0.01S_{t+2} + 0.005S_{t+3}$$

where

P_t = the number of containers that should be produced during quarter t

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W_t = the number of employees in quarter t .

S_t = a forecast of number of units of containers in quarter t .

Suppose that at the beginning of quarter 1 the inventory level was 80 and the work force level 100. Forecasts for quarters 1 to 4 are 600, 500, 300 and 200 respectively.

- (a) Determine the production rate and work force level for quarter 1.
 - (b) Suppose the actual shipment in quarter 1 was 500 units. What should the production rate and work force levels be for quarter 2 if the forecast for quarter 1 of the next year is 700 units? [16]
8. Explain about the dispatching boards. [16]

FirstRanker

Code No: K0321/R07

Set No. 4

IV B.Tech II Semester Supplementary Examinations, July 2011
PRODUCTION PLANNING AND CONTROL
(Mechanical Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Distinguish inventory control and scheduling functions.
 (b) Identify the location of PPC department in the organization chart of factory. [16]

2. A computer software firm has experienced the following demand for its "Personal Finance" software package:

Period	1	2	3	4	5	6	7	8
Units	56	61	55	70	66	65	72	75

- (a) Develop an exponential smoothing forecast using $\alpha = 0.4$ and an adjusted exponential smoothing using $\alpha = 0.4$ and $\beta = 0.20$
- (b) Compare the accuracy of two forecasts using MAD and cumulative error. [16]
3. Explain the basis of selective inventory control and explain the different (at least two) selection techniques adopted in an inventory control system. [16]
4. Suppose a company produces a type of desk that has the BOM given below. The desk is made by assembling two drawers, two handles, one drawer frame, and two legs into a drawer module. Then two drawer modules, desk back and a desk top are assembled into a desk.

Level No	Item description	No. Required	Lead Time(Weeks)
00	Desk		1
01	Desk top	1	2
01	Desk back	1	1
01	Leg/drawer module	2	1
01	Drawer frame	1	1
02	Desk legs	2	1
02	Drawers	2	2
02	Handles	2	2

For the following desk requirements, construct:

- (a) The material requirement plans for the desk and
- (b) Desk top and Desk back. [16]

Week	1	2	3	4	5	6	7	8	9	10
Requirement	-	-	-	-	20	0	50	0	0	30

Code No: K0321/R07

Set No. 4

5. How does routing in job shop production differ from continuous production system? [16]
6. A bomb squad faces a terrible situation that the members wish had never happened. A terrorist has planted five bombs in an airport building, endangering lives and property. The squad has located all five bombs and must now proceed to dismantle them. Because of limited staffing, the bombs can be dismantled only sequentially. Unfortunately, there is not much time left and the squad must choose judiciously the order in which the bombs will be dismantled. The following data represents a reliable estimate by the squad.

Bomb	1	2	3	4	5
Time to dismantle (hours)	3	1	2	4	1
Time remaining before the bomb will explode (hours)	9.0	11.25	11.0	6.0	5.0

- (a) What sequence for dismantling the bombs would you recommend to the squad? What should be the criterion that the squad optimize? [16]
7. In what ways does a multistage aggregate planning system take account of realities that would in fact affect decisions for production rates and work force size? [16]
8. Why is Follow-up required in production plants? Explain its role in production control. [16]

Code No: N0421/R07

Set No. 1

IV B.Tech II Semester Supplementary Examinations, July 2011
OPTICAL COMMUNICATIONS

(Electronics & Communication Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Compare optical fiber systems and conventional copper cable systems.
 (b) Calculate the critical angle, NA of step index fiber having $n_1 = 1.50$ core-cladding difference $\Delta = 1\%$. What is the maximum entrance angle θ_{max} for the fiber if the outer medium is air with $n = 1$. [8+8]
2. (a) Briefly describe micro bending and scattering losses in optical fibers.
 (b) Discuss different absorption losses in SiO_2 fiber at 850 nm, 1300 nm and 1550 nm. [8+8]
3. (a) Write notes on “dispersion shifted fiber and dispersion compensating fiber”.
 (b) Explain in detail about the refractive index profile dispersion and dispersion Vs bandwidth of the optical fiber. [8+8]
4. What is internal quantum efficiency of LED and derive the expression for the life time reduction caused by interfacial recombination. [16]
5. (a) With the help of neat diagrams describe lens coupling mechanisms to improve coupling efficiency from a fiber optic source.
 (b) Differentiate between Lambertian and monochromatic optical sources in terms of power coupling into a single mode fiber.
 (c) What is equilibrium numerical aperture? Explain the significance of equilibrium numerical aperture on source to fiber power coupling. [6+5+5]
6. (a) Describe important specifications of a semiconductor photo diode to be suitable for fiber optic communications.
 (b) Compute the range of quantum efficiency of an InGaAs PIN diode in the wavelength range between 1200 nm and 1600 nm if the responsivity of the diode is specified to be more than 0.6 A/W in the required wavelength region. Use the necessary physical constants listed. [8+8]

Speed of light in vacuum	$= 3 \times 10^8$ m/s
Electron charge	$= 1.602 \times 10^{-19}$ C
Planck's constant	$= 6.6256 \times 10^{-34}$ J-S
Boltzman's constant	$= 1.38 \times 10^{-23}$ J/K
Band gap energy of InGaAs	$= 0.73$ eV at 300K
7. (a) Discuss all the criteria to select the set of components sufficing design of a fiber optic link.

Code No: N0421/R07

Set No. 1

- (b) Describe the types of dispersion predominant in single mode and multimode fiber optic links.
 - (c) Estimate the effect of such dispersion on system rise-time for above types of fibers. [6+5+5]
8. (a) Describe the operation of uni-directional and bi-directional wavelength division multiplexing de-multiplexing in optical communication links.
- (b) What is line coding? Explain the requirement of line coding in optical communication systems.
 - (c) Does line coding contribute to improvement of eye patterns observed at an optical receiver? Justify your answer. [5+6+5]

FirstRanker

Code No: N0421/R07

Set No. 2

IV B.Tech II Semester Supplementary Examinations, July 2011
OPTICAL COMMUNICATIONS

(Electronics & Communication Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain the mode theory for circular wave guide.
 (b) Compare step index and graded index fibers in all aspects. [8+8]
2. (a) The mean optical power launched in to an optical fiber link is 1.5 mw and the fiber has an attenuation of 0.5 dB km^{-1} . Determine the maximum possible link length without repeaters (assuming loss less connectors) when the minimum mean optical power level required at the detector is $2 \mu\text{w}$.
 (b) Briefly describe the following linear scattering losses in optical fiber.
 - i. Rayleigh scattering
 - ii. Mie scattering. [8+8]
3. (a) Why does material dispersion occur in fiber? Explain in detail.
 (b) A step index multimode fiber has a core of 1.5 and a cladding index of 1.498. Find:
 - i. The inter modal dispersion factor for the fiber
 - ii. The total dispersion in an 18Km length
 - iii. The maximum bit rate allowed assuming dispersion limiting. [8+8]
4. (a) Draw the schematic of an edge emitting LED and explain the reasons for such construction.
 (b) Discuss the major requirements of an optical fiber emitter. [8+8]
5. (a) Describe various mechanisms usable to increase power coupling from an LED into a single mode fiber. Discuss the intricacies involved.
 (b) An LED with circular emitting region of radius $200 \mu\text{m}$ and an axial radiance of $60 \text{ W / cm}^2\text{- Sr}$ at 100mA drive current is coupled into a step index fiber of $50 \mu\text{m}$ radius and 0.24 numerical aperture.
 - i. Compute the power coupled into this step index fiber.
 - ii. Calculate the power coupled from the source specified about into a parabolic index graded-index fiber of same size as the step index fiber with $n_1=1.485$ and $\Delta = 0.01$. [6+5+5]
6. (a) Differentiate between the photodiode parameters, 'quantum limit' and 'dark current'.
 (b) The quantum efficiency of an In GaAs PIN diode is 80% in the wavelength range between 1300 nm and 1600 nm. Compute the range of responsivity of the PIN diode in the specified wavelength range. [8+8]

Code No: N0421/R07

Set No. 2

7. (a) Describe a method for determining the dispersion limitation of a given fiber optic link. Explain all the factors involved in the analysis.
- (b) Compute the modal-dispersion induced fiber rise time for the specifications of the fiber listed below. [8+8]
- | | |
|---|--------------|
| Bandwidth-distance product of the fiber | = 400 MHz-Km |
| Mode mixing factor over the length of the fiber | = 0.7 |
| Length of the optical fiber | = 6Km |
8. (a) What is WDM? Explain the principle of WDM while elaborating the requirement of WDM techniques in optical communication systems.
- (b) Describe analysis of eye pattern in digital optical communication system for estimation of timing jitter, optical link rise time and Noise margin from the observations made. [8+8]

FirstRanker

Code No: N0421/R07

Set No. 3

IV B.Tech II Semester Supplementary Examinations, July 2011
OPTICAL COMMUNICATIONS

(Electronics & Communication Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Draw the block diagram of an optical transmission link and explain the function of each element.
 (b) Discuss the applications of optical fiber system. [8+8]
2. (a) Write short notes on Plastic Optical Fibers".
 (b) Find the radius of curvature R at which the number of modes decreases by 50 percent in a graded index fiber take $\alpha = 2$, $n_2 = 1.5$, $\Delta = 0.01$, $a = 25 \mu\text{m}$, $\lambda = 1.3 \mu\text{m}$. [8+8]
3. (a) What is pulse broadening? Analyze pulse broadening in a graded index wave guide.
 (b) A certain optical fiber has attenuation of 3.5 dB/ Km at 850 nm. If 0.5 mw of optical fiber is initially launched in to the fiber, what is the power level in mw after 4Km? [8+8]
4. (a) A Ga Al As laser diode has a 600 μm cavity length has an effective absorption coefficient of 15cm^{-1} . For coated facts, the reflectiveness are 0.30 at each end. What is the optical gain at the lasing threshold.
 (b) If one end of the laser is coated with a dielectric reflector so that its reflectivity is now 80%. What is the optical gain at the lasing threshold?
 (c) If the internal quantum efficiency is 0.6, what is external quantum efficiency in case (a) and (b). [16]
5. (a) Define equilibrium numerical aperture.
 (b) An LED with circular emission region of diameter 200 μm and an axial radiance of $100 \text{ W / cm}^2\text{-Sr}$ at 100mA drive current is coupled into a step index fiber of 50 μm radius and of 0.22 numerical aperture. Compute the power coupled into this step index fiber. Compute the % difference in coupled power if the radius of the fiber is halved.
 (c) Calculate the power coupled from the source specified above into a parabolic index graded-index fiber of 50 μm diameter with $n_1=1.485$ and $\Delta = 0.01$. [3+8+5]
6. (a) Establish a relation between responsivity and quantum efficiency of a photo detector starting from definition of these two parameters.
 (b) Determine the quantum efficiency and responsivity of a PIN photodiode operating at 850 nm wavelength if 6.2×10^{12} photons incident at 850 nm generate 1.2×10^{12} electrons from the device.

Code No: N0421/R07

Set No. 3

- (c) Discuss the factors on which the response time of a photo detector depends. [8+8]
7. (a) Describe in detail various calculations and analyses required for designing a fiber optic link.
(b) Explain the analyses with suitable examples and graphical representation. [8+8]
8. Describe any TWO of the following:
- (a) Estimates made from Eye pattern analysis.
(b) Necessity of line coding in optical communication.
(c) Uni-directional and Bi-directional WDM for optical links. [8+8]

FirstRanker

Code No: N0421/R07

Set No. 4

IV B.Tech II Semester Supplementary Examinations, July 2011
OPTICAL COMMUNICATIONS

(Electronics & Communication Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Bring out the advantages of adopting optical fiber communications over other form of communication system.
 (b) What are the various elements of an optical communication system? Explain the function of each element. [8+8]
2. (a) Distinguish between Rayleigh scattering and Mie scattering.
 (b) A 15 km optical fiber link uses fiber with a loss of 1.5 dB km⁻¹. The fiber is jointed every kilometer with connectors which give an attenuation of 0.8 dB each. Determine the minimum mean optical power which must be launched in to the fiber in order to maintain a mean optical power level of 0.3 μw at the detector. [8+8]
3. (a) Calculate the material dispersion at $\lambda_0=1550 \text{ nm}$ $\frac{d^2n_1}{d\lambda^2} = -4.2 \times 10^{-1} \mu\text{m}^{-2}$ at $\lambda_0=1550\text{nm}$. Spectral spread of the source is 20 nm.
 (b) In the pulse broadening measurements, the input pulse width is 300 ps. The output pulse width is about 12 ns. The fiber length is 2.4 km. Assuming the pulse shape and fiber impulse response are Gaussian. Calculate the pulse broadening in ns km⁻¹ and the bandwidth length product. [8+8]
4. (a) Two multimode step index fibers have NAs of 0.2 and 0.4 respectively and both have the same core refractive index which is 1.48. Estimate the insertion loss at a joint in each fiber caused by a 5° angular misalignment of the fiber core axes. It may be assumed that the medium between the fibers is air.
 (b) Explain the intrinsic coupling losses at fiber joint due to mismatch of core diameter, NA and refractive index profile difference. [8+8]
5. (a) Describe lensing mechanisms to improve coupling efficiency between a source and a fiber.
 (b) Derive an expression for power coupled from a Lambertian surface emitting LED into a smaller step-index fiber. [8+8]
6. (a) Derive an expression for sensitivity of a PIN diode based digital fiber optic receiver including all the types of noise sources in the receiver.
 (b) A silicon PIN diode with a responsivity of 0.5 A/W is operated at a binary signaling rate of 35 Mbps and working at 850 nm wavelength. Determine the minimum optical power required to be incident in order to maintain a BER of 10⁻⁸. [8+8]

Code No: N0421/R07

Set No. 4

7. (a) List and describe all the system considerations for selection of components in the design of a fiber optic link.
(b) Describe a procedure to carryout the power budget analysis of a fiber optic link. [8+8]
8. (a) Define polarization mode Dispersion? Describe a method to measure polarization mode dispersion in an optical fiber?
(b) Describe a procedure to measure baseband fiber frequency response. If this frequency response is used in dispersion measurement, comment on the type of dispersion measured and domain in which measurement is made. [8+8]

FirstRanker

Code No: L0521/R07

Set No. 1

IV B.Tech II Semester Supplementary Examinations, July 2011
MANAGEMENT SCIENCE
 (Common to Computer Science & Engineering and Information
 Technology)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
 All Questions carry equal marks

1. What are the basic leadership styles and their corresponding effective and ineffective styles? [16]
2. What is virtual organisation? Discuss the reasons for the emergence of the concept of virtual organisation. [16]
3. What is job order production? Explain its characteristics. [16]
4. Define purchasing. State the objectives of purchasing. [16]
5. Examine the importance of training of personnel towards the development of an organization. [16]
6. The various time estimates of activities involved in a project are given in table; Determine;
 - (a) Determine the expected completion time of the project.
 - (b) Determine the variance and standard deviation of the project.
 - (c) Determine the probability factor of completing the project with in 23 days. [5+5+6]

Activities	T_o	T_m	T_p
1-2	2	6	10
1-3	4	8	12
2-4	2	3	4
2-3	2	4	6
3-4	0	0	0
3-5	3	6	9
4-6	6	10	14
5-6	1	3	5

7. How would a company achieve synergy among different functions and business units? [16]
8. Is re-engineering another fad or does it offer something of lasting value? [16]

Code No: L0521/R07

Set No. 2

IV B.Tech II Semester Supplementary Examinations, July 2011
MANAGEMENT SCIENCE
(Common to Computer Science & Engineering and Information
Technology)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. State and describe the Fayol's principles of management. [16]
2. Define 'Departmentation' Explain its need in industries. [16]
3. What is sampling? Explain the various kinds of sampling plans. [16]
4. Explain the following terms with the help of a neat diagram.
 - (a) Economic order quantity and Lead time
 - (b) Safety stock and Re-order point
 - (c) Maximum inventory and Minimum inventory
 - (d) Average inventory and Inventory consumption trend. [4×4]
5. Discuss the objectives of Personnel Management. Describe the functional and Organizational role of personnel manager in achieving the organizational goals. [16]
6. What is the difference between a schedule graph based on ES & a schedule graph based on LS? Explain. [16]
7. Can strategic management fail? Can it be prevented? [16]
8. Is re-engineering another fad or does it offer something of lasting value? [16]

Code No: L0521/R07

Set No. 3

IV B.Tech II Semester Supplementary Examinations, July 2011
MANAGEMENT SCIENCE
(Common to Computer Science & Engineering and Information
Technology)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. "Theory X and Theory Y are concerned with the nature of the people". How does the job situation affect the application of this theory? What are its implications? [16]
2. Differentiate between cellular organisation and boundary-less organisation. Explain their merits and demerits. [16]
3. Define the mass production. How does it differ from job order production? [16]
4. What do you understand by Economic order quantity? Derive the formula for determining the Economic order quantity. [16]
5. Briefly explain the concept of selection. What are the different techniques of selection followed by a Personnel Manager, while employing the personnel in an organization? [16]
6. What is the importance of Cost Analysis? Account for different types of cost citing examples. [16]
7. What are the steps involved in corporate planning? [16]
8. Is re-engineering another fad or does it offer something of lasting value? [16]

Code No: L0521/R07

Set No. 4

IV B.Tech II Semester Supplementary Examinations, July 2011
MANAGEMENT SCIENCE
 (Common to Computer Science & Engineering and Information
 Technology)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Explain theory X and theory Y as theories of motivation. [16]
2. "Organisation structure refers to the differentiation and integration of activities, authority, roles and relationships". Explain. [16]
3. Explain in brief the basic procedure of work measurement. [16]
4. Define materials management. What are its objectives? [16]
5. What is the purpose of internal mobility? When are demotions necessitated in organizations? [16]
6. The following table lists the jobs of a network along with the time estimates.

Jobs	Duration in days		
	Optimistic	Most likely	Pessimistic
1-4	3	9	27
1-3	3	6	15
1-2	6	12	30
4-5	1	4	7
3-5	3	9	27
3-6	2	5	8
5-6	6	12	30
2-6	4	19	28

- (a) Draw the project network
- (b) What is the approximate probability that jobs on the critical path will be completed by the due date of 35 days
- (c) What is your estimate of the probability that the entire project will be completed by the due date? Explain.
- (d) What due date has 90% of chance of being met? [4×4]
7. According to Porter's model, what determines the competition intensity in an industry? With respect to a firm that you know, identify the key strategic factors in its external environment. [16]
8. Write short notes on:
 - (a) Capability Maturity Model (CMM)

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- (b) Just-in-Time (JIT)
- (c) Balanced Scored Card.

[5+5+6]

FirstRanker

Code No: K0821

R07

Set No. 1

IV B.Tech. II Semester Supplementary Examinations, July, 2011
INDUSTRIAL POLLUTION CONTROL ENGINEERING
(Chemical Engineering)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Explain the different types of emissions from chemical industries and give its environmental effects. [16]
2. a) Discuss sources and characteristics of pulp and paper industries. [8]
b) Explain briefly the concepts of self purification of running streams [8]
3. Write about the control measures that need to be followed to reduce NO_x pollution [16]
4. a) What are the types of pollutants present in ambient air? [6]
b) Explain the sampling and measurement of air pollutants. [10]
5. a) What is collection efficiency? Give the equations to determine it. [8]
b) Fabric and fiber characteristics of a fabric filter. [8]
6. a) Explain briefly about stabilization ponds [8]
b) Justify the statement "Secondary treatment is also called as biological treatment." [8]
7. Explain how the waste water is treated by the ion exchange method and the resin regeneration. [16]
8. a) Discuss various methods of collection for biomedical wastes. [8]
b) Classify the chemical wastes and explain them with suitable examples [8]

Code No: K0821

R07

Set No. 2

IV B.Tech. II Semester Supplementary Examinations, July, 2011
INDUSTRIAL POLLUTION CONTROL ENGINEERING
(Chemical Engineering)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Explain the approaches generally followed in environmental legislation and write a brief note on water act of 1974. [16]
2. Explain the process of determination of BOD, COD and TOC in effluent water? How these can influence the quality of water. [16]
3. Explain the method of control and removal of sulfur dioxides from gaseous effluent. [16]
4. Describe different analytical procedures to collect and characterize particulate matter from effluent streams [16]
5. a) List out the equipment for control of gaseous emissions. [6]
b) Explain any two of the equipments used for control of gaseous emissions [10]
6. Explain briefly the following
a) Trickling filters [5]
b) Rotary drum filters [5]
c) Bacterial and Bacterial growth curve [6]
7. Explain:
a) Reverse osmosis [6]
b) Ultra filtration. [4]
c) Ozonation. [6]
8. Explain recovery and recycling of various chemicals wastes in detail. [16]

Code No: K0821

R07**Set No. 3**

IV B.Tech. II Semester Supplementary Examinations, July, 2011
INDUSTRIAL POLLUTION CONTROL ENGINEERING
(Chemical Engineering)

Time: 3 Hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. a) What are the factors that led to enactment of legislation on pollution? Discuss. [8]
b) Elucidate the need for the 'Environmental legislation'. [8]
2. Discuss briefly the following
a) Oxygen Sag curve [8]
b) BOD sag curve [8]
3. What are the major sources of oxides of nitrogen and sulfur? Explain the effects caused by SO_x and describe their removal from gases. [16]
4. Explain briefly:
a) Sampling system [6]
b) Particulate sampling [5]
c) Gaseous sampling [5]
5. Explain briefly the following [4x4]
a) Wet Scrubbers
b) Centrifugal scrubbers
c) Cyclone separators
d) Fabric filters
6. Explain anaerobic process of waste water treatment. [16]
7. a) What is Flotation? Differentiate between Flotation and Sedimentation. [8]
b) Explain briefly about various methods available for final purification of water [8]
8. What are the health and environmental effects of nuclear waste? [16]

Code No: K0821

R07

Set No.4

IV B.Tech. II Semester Supplementary Examinations, July, 2011
INDUSTRIAL POLLUTION CONTROL ENGINEERING
(Chemical Engineering)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. What are the sources of waste water? Explain the guidelines and standards of effluent waste water. [16]
2. Explain the sources and characteristics of pollutants in petroleum and petroleum industry. [16]
3. a) Explain the control methods and removal of Organic vapors from the gaseous effluents. [8]
b) Explain one of the methods for control of NO_x at source level. [8]
4. Briefly discuss the analysis of the following [4x4]
 - a) Particulate matter
 - b) Oxidants and ozone
 - c) Sulphur oxides
 - d) Hydrocarbons
5. a) Write the design aspects of scrubbers. [10]
b) Explain briefly the Removal of gaseous and liquid pollutants from air [6]
6. Explain the suspended growth process in detail. [16]
7. Discuss briefly the methods for primary and Tertiary treatment for water purification. [16]
8. Discuss various methods of collection and disposal of biomedical wastes. [16]

Code No: K1021/R07

Set No. 1

IV B.Tech II Semester Supplementary Examinations, July 2011
INDUSTRIAL ELECTRONICS
 (Electronics & Instrumentation Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain the need for DC amplifiers and give two examples.
 (b) What is drift? Explain the reasons, which causes drift in DC amplifier circuits. [8+8]
2. (a) With a neat sketch explain the operation of a shunt type voltage regulator and derive the expressions for series resistance.
 (b) Design a shunt regulator for output voltage of 9.1V; I_L (max)= 100mA; I_L (min)= 10mA; I_Z (knee)= 20mA; $V_{in} = 20V$. [10+6]
3. (a) Sketch a regulator circuit that uses an LM 217 IC positive voltage regulator and explain its working.
 (b) Define short period and long period accuracy of a stabilizer. Give typical values of these parameters. [8+8]
4. (a) Explain in detail the turn off mechanism of an SCR.
 (b) Explain why the inner two layers of an SCR are lightly doped and are wide.
 (c) Explain why the holding current of an SCR is less than the latching current. [5+5+6]
5. A series inverter has the following parameters: inductance $L=12mH$, $C= 0.1$ microF, load resistance $R=100$ Ohms and $T_{off}=0.3$ millisec. Determine
 (a) the frequency of the output voltage and
 (b) the attenuation factor. [8+8]
6. Draw the circuit and describe the principle of operation of a type A single quadrant DC chopper. Draw its $V_0- I_0$ characteristics? [16]
7. (a) Draw the circuit of SE/NE 555 IC timer as astable multivibrator and explain.
 (b) Draw the waveforms of output voltage and capacitor voltage, with proper explanation. [8+8]
8. Discuss in detail about the generation of ultrasonic waves? [16]

Code No: K1021/R07

Set No. 2

IV B.Tech II Semester Supplementary Examinations, July 2011
INDUSTRIAL ELECTRONICS
 (Electronics & Instrumentation Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Draw a simple DC amplifier circuit and derive voltage gain with the help of the equivalent circuit.
 (b) Explain how emitter drift compensation is achieved in a DC amplifier. [8+8]
2. (a) Explain the need for protection techniques in regulated power supplies? Explain any two techniques in detail.
 (b) Draw a block diagram of an electronic regulator and derive an expression for its regulation sensitivity. [8+8]
3. (a) Explain in detail about both positive and negative type of three terminal IC voltage regulators.
 (b) Give the comparison between linear and switched mode voltage regulators. [8+8]
4. (a) Explain in detail about various voltage ratings and current ratings of a transistor.
 (b) Ten thyristors are used in a string to withstand a DC voltage of 12 KV. The maximum leakage current and recovery charge difference of SCRs is 10 mA and 50 μC respectively. The values of R for steady state equalizing circuit is 40 K Ω and value of capacitance C of dynamic equalizing circuit is 0.2 μf . Find the steady state and transient de-rating factor. [8+8]
5. Draw the circuit and describe the operation in detail, of a single phase thyristor inverter using centre tapped load? [16]
6. (a) Draw and explain the circuit of current commutated thyristor chopper.
 (b) Describe its working in different modes and draw waveforms of currents and voltages. [8+8]
7. Give the construction and describe the working of
 - (a) spring loaded bimetal thermal timer and
 - (b) thermal expansion timer. [8+8]
8. Describe the working of pulsed echo ultrasonic flaw detector? [16]

Code No: K1021/R07

Set No. 3

IV B.Tech II Semester Supplementary Examinations, July 2011
INDUSTRIAL ELECTRONICS
 (Electronics & Instrumentation Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain about difference mode gain and common mode gain of a differential amplifier and define CMRR.
 (b) Give the basic circuit of a differential amplifier and discuss the working principle of the circuit. [8+8]
2. (a) Explain the series regulator using pre-regulator and Darlington pair.
 (b) What are the different protection techniques used in regulated power supplies? [8+8]
3. (a) Sketch a regulator circuit that uses an LM 217 IC positive voltage regulator and explain its working.
 (b) Define short period and long period accuracy of a stabilizer. Give typical values of these parameters. [8+8]
4. (a) Explain in detail about various voltage ratings and current ratings of a transistor.
 (b) Ten thyristors are used in a string to withstand a DC voltage of 12 KV. The maximum leakage current and recovery charge difference of SCRs is 10 mA and 50 μC respectively. The values of R for steady state equalizing circuit is 40 K Ω and value of capacitance C of dynamic equalizing circuit is 0.2 μf . Find the steady state and transient de-rating factor. [8+8]
5. Draw the circuit and describe the operation of a single phase bridge inverter. Draw the waveforms of various voltages involved? [16]
6. Draw the circuit and describe the principle of operation of four quadrant dc chopper. Draw its $V_0 - I_0$ characteristics. [16]
7. Describe the principle of projection welding. Give its main applications. [16]
8. Draw the circuit and briefly describe the working of high frequency power source for induction heating. [16]

Code No: K1021/R07

Set No. 4

IV B.Tech II Semester Supplementary Examinations, July 2011
INDUSTRIAL ELECTRONICS
(Electronics & Instrumentation Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain the principle of operation of a Darlington emitter follower circuit and derive its gain.
 (b) Draw the circuit diagram of a cascode transistor amplifier and explain its working. [8+8]
2. (a) Explain the series regulator using pre-regulator and Darlington pair.
 (b) What are the different protection techniques used in regulated power supplies? [8+8]
3. (a) With a neat circuit diagram describe the operation of an IC shunt voltage regulator circuit.
 (b) How is short circuit current protection provided for an IC regulator? Draw the circuit diagram and explain its operation. [8+8]
4. (a) Explain in detail about various voltage ratings and current ratings of a transistor.
 (b) Ten thyristors are used in a string to withstand a DC voltage of 12 KV. The maximum leakage current and recovery charge difference of SCRs is 10 mA and 50 μ C respectively. The values of R for steady state equalizing circuit is 40 K Ω and value of capacitance C of dynamic equalizing circuit is 0.2 μ f. Find the steady state and transient de-rating factor. [8+8]
5. A series inverter has the following parameters: inductance L=12mH, C= 0.1 microF, load resistance R=100 Ohms and Toff=0.3millisec. Determine
 (a) the frequency of the output voltage and
 (b) the attenuation factor. [8+8]
6. Draw the circuit and describe the principle of operation of a type A single quadrant DC chopper. Draw its V_0 - I_0 characteristics? [16]
7. Give the construction and describe the working of
 (a) spring loaded bimetal thermal timer and
 (b) thermal expansion timer. [8+8]
8. What are the merits and drawbacks of induction heating? [16]

Code No: K1121

R07

Set No. 1

IV B.Tech. II Semester Supplementary Examinations, July, 2011
BIOMEMS
(Bio-Medical Engineering)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Why Silicon will be used as a seed material for MEMS manufacturing? [8+8]
(b) Explain the reactions used in silicon production.
2. (a) Explain the attractive forces between surfaces present in wet etching. [8+8]
(b) Explain the mechanics of Polysilicon Comb Drives
3. (a) Explain electrochemical etching with block diagram [8+8]
(b) What are the features of electrostatic Comb Drives?
4. (a) What is LIGA process? Explain the LIGA process sequence with [8+8]
Schematic.
(b) What are the basic safety rules in clean rooms
5. Explain different blocks in retinal scanning display [16]
6. (a) Explain about piezoresistivity, p-type material uses and application to [8+8]
MEMs.
(b) Explain the different working principles behind thermal transducers
7. (a) What are the required components for wireless MEMS? Explain them [8+8]
briefly.
(b) Differentiate between thin film and micro fluid cell.
8. (a) Describe on the considerations of micro-system packaging. [8+8]
(b) Describe on Hexsil process. Explain the various techniques involved in it.

Code No: K1121

R07

Set No. 2

IV B.Tech. II Semester Supplementary Examinations, July, 2011

BIOMEMS

(Bio-Medical Engineering)

Time: 3 Hours

Max Marks: 80

**Answer any FIVE Questions
All Questions carry equal marks**

1. (a) Explain the most important CVD technologies in MEMS [8+8]
(b) When does one want to use CVD?
2. (a) What are the Applications for Bio- MEMS? [8+8]
(b) Explain the Electrostatics of Polysilicon Comb Drives
3. (a) Elaborate the differences between additive process and subtractive process. [8+4+4]
(b) Describe about Lift- off process.
(c) What are the Wet release issues.
4. Explain CMOS fabrication steps with simple schematics. [16]
5. (a) Explain the different types of optical switches with neat diagram. [10+6]
(b) State and explain Lens maker's equation.
6. (a) Explain the working principle of Thermal biomorph with neat schematic. [8+8]
(b) Explain about the Atomic Force Microscope (AFM).
7. Draw a simple series resonant Oscillator. Draw the Bode plot for low Q and [16]
for high Q
8. (a) Describe with neat sketch of plastic-encapsulated microcircuit used in Bio- [8+8]
MEMS.
(b) What are the Advantages and Disadvantages of Lab-on-a-chip

Code No: K1121

R07

Set No. 3

IV B.Tech. II Semester Supplementary Examinations, July, 2011

BIOMEMS

(Bio-Medical Engineering)

Time: 3 Hours

Max Marks: 80

**Answer any FIVE Questions
All Questions carry equal marks**

1. (a) When does one want to use wet etching and dry etching? [8+8]
(b) Explain wet etching with agitation and no agitation with schematic.
2. (a) Explain electrochemical etching with block diagram [8+8]
(b) What is additive process? Explain the techniques present in additive Process
3. (a) Explain the methodologies used in MEMS post processing. [8+8]
(b) Explain the packaging aspects of MEMS in medical area.
4. (a) Explain the physics of fiber filtration in clean rooms. [8+8]
(b) Explain briefly about High efficiency particulate air filters in clean rooms.
5. (a) Explain the light valve and also grating technique used in it. [8+8]
(b) Discuss the diffraction mode of operation principle.
6. (a) Describe the piezo resistance, material types used in MEMs. [8+8]
(b) Explain the working principle of Chevron actuator with neat schematic
7. (a) Compare the mechanical and electrical resonators. [8+8]
(b) Define quality factor? How fast the energy dissipate in a MEMS resonators
8. (a) Explain on deterministic and stochastic process of MEMs processing. [8+8]
(b) Differentiate between the traditional assembly and micro-assembly.

Code No: K1121

R07

Set No. 4

IV B.Tech. II Semester Supplementary Examinations, July, 2011

BIOMEMS

(Bio-Medical Engineering)

Time: 3 Hours

Max Marks: 80

**Answer any FIVE Questions
All Questions carry equal marks**

1. Explain briefly about different lithography process and problems with lithography [16]
2. (a) What is additive process? Explain the techniques present in additive process [8+8]
(b) A cantilever beam having dimensions of (length: breadth: width) 100:2:2 micrometers, How much does beam bend in 1g gravity field? Assume necessary data.
3. (a) Draw and explain the CMOS inverter with a schematic. [8+8]
(b) Explain the packaging aspects of MEMS in medical area.
4. (a) Define toxicity. Describe the poisoning effects in clean rooms. [6+5+5]
(b) Describe the types of poisons appeared in clean room process.
(c) What are the types of poisoning effects?
5. (a) Brief the digital micro-mirror device and DLP technology. [8+8]
(b) Detail the function of micro-mirror and its various applications.
6. Explain the concepts of Scanning Tunneling Microscope (STM). Explain the factors affecting the tunneling current [16]
7. Describe an electrical equivalent circuit for a mechanical system comprises with a parallel combination of dashpot and spring. [16]
8. Explain briefly about MEMS Drug Delivery Devices [8+8]

Code No: K1921/R07

Set No. 1

IV B.Tech II Semester Supplementary Examinations, July 2011
ADVANCED COMPUTER ARCHITECTURE
(Electronics & Computer Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Write notes on performance of the computers. [16]
2. Explain various addressing modes in computer architecture. [16]
3. Explain data dependent hazard with example? [16]
4. What is meant by trace scheduling? Explain in detail? [16]
5. (a) Explain how to decide between split cache and unified cache?
(b) Explain how to calculate average memory access time and processor performance. [8+8]
6. (a) Write about the hardware primitives for synchronization.
(b) Explain about spin locks with an examples. [8+8]
7. (a) What is the meant by flash memory and explain? What is the difference between the flash memory and PROM?
(b) Compare the times to read and write a 64KB block to a flash memory and magnetic disk. For flash assume it takes 65ns to read 1byte, 1.5 μ s to write 1byte, and 5ms to erase 4KB. Assume the measure seek time is $1/3^{rd}$ of the calculated average, the controller overhead is .1ms and the data stored in the outer tracks ,give it the faster transfer rates. [8+8]
8. What is a cluster? Explain about the designing of a cluster with an example. [16]

Code No: K1921/R07

Set No. 2

IV B.Tech II Semester Supplementary Examinations, July 2011
ADVANCED COMPUTER ARCHITECTURE
(Electronics & Computer Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Write the formula for total execution time. Explain the same with an example?
[16]
2. (a) Write a detailed notes on register-register architecture.
(b) Give a note on little endian format. [12+4]
3. Explain the effect of branch prediction scheme with the help of a neat diagram.[16]
4. What are the four methods that support speculation without introducing erroneous exception behavior? [16]
5. (a) Explain how to improve cache performance?
(b) Assume the cache miss penalty is 100 clock cycles and all instructions normally take 1.0 clock cycles [ignoring memory stalls]. Assume the average miss rate is 2%, there is an average of 1.5 memory references for instruction, and the average number of cache misses per 1000 instructions is 30. What is the impact on performance when behavior of the cache is included? Calculate the impact using both misses per instruction and miss rate. [8+8]
6. (a) Assume that words x_1 and x_2 are in the same cache block, which is in the shared state in the caches of p_1 and p_2 . Assuming the following sequence of events, identify each miss as a true sharing miss, a false sharing miss, or a hit. Any miss that would occur if the block size were one word is designated a true sharing miss.

Time	P_1	P_2
1	Write x1	
2		Read x2
3	Write x1	
4		Write x2
5	Write x1	

- (b) What is meant by false sharing, when does it occur?
7. Write about
 - (a) Memory mapped IO
 - (b) Interrupt driven IO
 - (c) Polling. [6+6+4]

Code No: K1921/R07

Set No. 2

8. (a) What is meant by congestion ? Explain how it can be eliminated.
(b) Explain about Distributed switches. [10+6]

FirstRanker

Code No: K1921/R07

Set No. 3

IV B.Tech II Semester Supplementary Examinations, July 2011
ADVANCED COMPUTER ARCHITECTURE
(Electronics & Computer Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Why integrated circuit costs effect the computer architecture. Explain in detail. [16]
2. With a neat diagram explain the structure of recent compilers. [16]
3. Explain data dependent hazard with example? [16]
4. Explain static branch prediction. [16]
5. (a) Discuss the several features of the hierarchy of memory.
 (b) Define the terms Cache hit, spatial locality, temporal locality. [10+6]
6. (a) Assume that words x_1 and x_2 are in the same cache block, which is in the shared state in the caches of p_1 and p_2 . Assuming the following sequence of events, identify each miss as a true sharing miss, a false sharing miss, or a hit. Any miss that would occur if the block size were one word is designated a true sharing miss.

Time	P_1	P_2
1	Write x1	
2		Read x2
3	Write x1	
4		Write x2
5	Write x1	

- (b) What is meant by false sharing, when does it occur?
7. Write about
 - (a) Memory mapped IO
 - (b) Interrupt driven IO
 - (c) Polling. [6+6+4]
8. (a) Write short notes on:
 - i. Fibre optic Components
 - ii. Fibre Optic Cables
 - iii. Wavelength division multiplexing.
 (b) Briefly Write about the performance parameters of interconnection networks. [8+8]

Code No: K1921/R07

Set No. 4

IV B.Tech II Semester Supplementary Examinations, July 2011
ADVANCED COMPUTER ARCHITECTURE
(Electronics & Computer Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Define wall-clock time.
(b) Give a brief note on:
 - i. Desktop Branch mark
 - ii. Server Branch mark[8+8]
2. Write notes on :
 - (a) gather / scatter addressing.
 - (b) little endian and big endian formats?[8+8]
3. Explain data dependent hazard with example? [16]
4. (a) What are the advantages of multiple-issue processors?
(b) Write a note on local scheduling? [8+8]
5. (a) Explain about Trace caches.
(b) What is meant by a slow hit? Give the relationship between regular hit time, pseudo hit time and miss penalty. [8+8]
6. (a) How does the queuing lock work?
(b) Explain about coarse grained multithreading. [8+8]
7. (a) What do you mean by the "hot swapping"?
(b) Explain "mirroring".
(c) Explain the block interleaved parity and distributed block interleaved parity. [6+5+5]
8. What is a cluster? Explain about the designing of a cluster with an example. [16]

Code No: K2121

R07

Set No. 1

IV B.Tech. II Semester Supplementary Examinations, July, 2011
AIRCRAFT SYSTEMS AND INSTRUMENTATION
(Aeronautical Engineering)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Compare and contrast the two hydraulic systems-open systems and closed systems. [16]
2. (a) Distinguish between primary and secondary flight control surfaces.
(b) Write a short note on flight control linkage systems. [8+8]
3. Using a schematic layout of analog air data computer, explain the operation of a fully powered airplane control system. [16]
4. Write a detailed note on electrical load management systems (ELMs). Provide necessary circuit diagram to support the discussion. [16]
5. (a) Draw the diagram of a vapour cycle cooling system and explain.
(b) How does a basic air cycle system differs from vapour cycle cooling system? [8+8]
6. Describe working principle of a BAE146 family yellow hydraulic system with a simple sketch. [16]
7. Explain the need for limiting the pressure differential between the inside of the cabin and outside of the cabin at different altitudes. [16]
8. Integrated Flight Management in Air Bus 320 aeroplane is with built in Flight & Propulsion control. Explain with the help of a simple block-diagram. [16]

Code No: K2121

R07

Set No. 2

IV B.Tech. II Semester Supplementary Examinations, July, 2011
AIRCRAFT SYSTEMS AND INSTRUMENTATION
(Aeronautical Engineering)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Explain the different types of valves in an aircraft hydraulic system. [16]
2. Explain in detail:
 - (a) Top-down approach, and
 - (b) Bottom-down approach. [8+8]
3. (a) Using a schematic layout explain the functioning of a typical fly-by-wire system interfacing a digital computer and Air engine data flow. [8]
(b) Compare conventional control systems with power assisted flight control systems. [8]
4. With the help of a neat sketch, discuss main features of Boeing 777 primary Flight control system (PFCS). [16]
5. (a) List out the parameters that are to be monitored during the operation of an aero engine. [8]
(b) Explain a supervisory electronic engine control system of a modern airplane with a schematic layout. [8]
6. Provide a summary over developments that took place in engine control systems starting from simple to modern design aircraft. Use neat diagrams wherever necessary. [16]
7. Explain the air conditioning system of an airliner with the help of a block diagram. [16]
8. Write a detailed note on the following:
 - (a) Various electric Loads in any aircraft
 - (b) Electrical system displays requirements. [8+8]

Code No: K2121

R07**Set No. 3**

IV B.Tech. II Semester Supplementary Examinations, July, 2011
AIRCRAFT SYSTEMS AND INSTRUMENTATION
(Aeronautical Engineering)

Time: 3 Hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. Compare the working principles of the following actuators:
 - (a) Electro-mechanical type of actuators
 - (b) Electro-hydrostatic type of actuators. [8+8]

2. (a) With the help of a schematic arrangement explain how a Digital Air Data Computer (ADC) works in the aircraft.
(b) Describe the Auto-pilot system in detail. [8+8]

3. Write a detailed note on the conditioning of the hydraulic fluid intended for aviation purpose. [16]

4. Discuss the flight control and monitoring requirements of an aircraft. [16]

5. Write short notes on the following related to typical aircraft product life cycle:
 - (a) Design phase
 - (b) Build phase. [8+8]

6. (a) How does a 'photo-electric cell detector' work in a fire suppression circuit. [8]
(b) With the help of a block diagram, explain the fire extinguisher circuit of Jet Aircraft. [8]

7. Explain various tasks addressed by the Fuel management, quantity gauging system and thermal management functions in a bombardier Global Express family of systems. [16]

8. (a) Write about various protection systems, which are found commonly in use with Aircraft electric systems. [8]
(b) Draw a diagram and explain 'Differential relay' in aircraft electrics. [8]

Code No: K2121

R07**Set No. 4**

IV B.Tech. II Semester Supplementary Examinations, July, 2011

AIRCRAFT SYSTEMS AND INSTRUMENTATION

(Aeronautical Engineering)

Time: 3 Hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. Write short notes on the following related to modern electrical power generation types:
 - (a) DC power generation using an Engine-Driven Integrated Drive-Generator (IDG)
 - (b) Variable speed-constant Frequency power generation. [16]
2. Write short notes on the following: [16]
 - (a) Vapor cycle system (Freon).
 - (b) Oxygen regulators.
 - (c) Fire extinguisher.
 - (d) Need of cabin pressurization.
3. Discuss a full authority control system (FADEC) of a modern aircraft with electrical throttle signaling. Bring out the major differences that the mechanism possesses over a simple control system of a trainer aircraft. Use neat diagrams for explanation.[16]
4. Explain the functioning of a communication system in an aircraft. Why is it required? [16]
5. Discuss in detail the A.C. and D.C. type fuel quantity flow measurement systems employed in aircraft. [16]
6. (a) Why does an oxygen system is listed under aircraft Utility Systems? [8]
(b) With the help of a rough sketch explain a typical oxygen system for a light twin engine airplane. [8]
7. Write a detailed note on cabin pressurization procedures in an aircraft. [16]
8. (a) What is meant by Fuel sediments? [6]
(b) Explain various quality check tests to be carried out on Aviation fuel. [10]

Code No: K2321

R07

Set No. 1

IV B.Tech. II Semester Supplementary Examinations, July, 2011
ANIMAL CELL SCIENCE AND TECHNOLOGY
(Bio-Technology)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. List out the essential equipments used in animal cell culture. Discuss briefly the different types of Biosafety cabinets available for cell culture purpose.
2. Write in detail about
 - a) Protein free medium
 - b) Serum free medium
3. What is cytotoxicity? Explain the various methods employed for measuring cytotoxicity in cell culture?
4. Give a detailed account on cell separation techniques by giving a note on importance of cell separation
5. Give a clear illustration on following
 - a) Fluidized bed reactor
 - b) Micromanipulator
6. Make differences between adult stem cells and embryonic stem cells. Give a detailed account on therapeutic importance of embryonic stem cells.
7. Write in detail about programmed cell death and give a note on its importance in evolution
8. Discuss in detail about tissue engineering by giving an account on artificial skin.

Code No: K2321

R07

Set No. 2

IV B.Tech. II Semester Supplementary Examinations, July, 2011
ANIMAL CELL SCIENCE AND TECHNOLOGY
(Bio-Technology)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Write in short about
 - a) Balanced salt solution
 - b) Laminar air flow unit
2. Give a detailed depiction on physico chemical properties attributed by the culture medium.
3. Discuss in detail about
 - a) Warm and cold trypsinization (Enzymatic disaggregation)
 - b) Subculturing of monolayer
4. Differentiate between organ and histotypic cultures & Mention the applications
5. Enumerate the importance of vaccines and explain in detail about cell culture based vaccines
6. Give an account on applications of animal cell culture
7. Give a detailed illustration on molecular mechanisms of intrinsic & extrinsic pathway
8. Discuss about Three dimensional culture by adding a note on its importance in medical research

Code No: K2321

R07

Set No. 3

IV B.Tech. II Semester Supplementary Examinations, July, 2011
ANIMAL CELL SCIENCE AND TECHNOLOGY
(Bio-Technology)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Discuss the role of serum in culturing animal cells. What are the advantages and disadvantages of adding serum in the animal culture medium?
2. Explain various methods used in cell culture for cell separation
3. Make differences between
 - a) Primary and established cell lines
 - b) Monolayer and suspension cultures
4. Discuss about
 - a) Culture based vaccines
 - b) Intrinsic pathway of apoptosis
5. Give short notes on
 - a) Histotypic culture
 - b) Somatic cell nuclear transfer
6. Discuss in detail about tissue engineering.
7. Describe the methods for measuring the viability of the cells.
8. What are transformed cell lines and explain the methods involved in cell transformation.

Code No: K2321

R07

Set No. 4

IV B.Tech. II Semester Supplementary Examinations, July, 2011
ANIMAL CELL SCIENCE AND TECHNOLOGY
(Bio-Technology)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Write in short about
 - a) Cell synchronization
 - b) Micromanipulation
2. Give an account on
 - a) Cell cloning
 - b) Stem cell culture
3. Make differences between organ and hystotypic culture and explain in detail about organ culture
4. Explain the role of following in culture medium
 - a) CO₂ and sodium bicarbonate
 - b) Serum
5. Discuss in detail about attaining primary cell line with diagrammatic representation.
6. Give the importance of characterization in animal cell culture. Explain two different methods used for characterizing a cell line.
7. Discuss in detail about scaling-up of animal cell culture.
8. Give a detailed depiction on tissue engineering.