B.Pharm. Second Semester (Old)
35148 : Mathematics : 2.6

P. Pages : 3

Time : Three Hours

AW - 2294

Max. Marks : 60

0545	

Notes : 1. All question carry equal marks.
2. Answer **any five** question from given **7** questions.
3. Use of slide rule logarithmic tables, Steam tables, Moller's Chart, Drawing instrument, Thermodynamic table for moist air, Psychrometric Charts and Refrigeration charts is permitted. Use of calculator is permissible.
4. Use of pen Blue/Black ink/refill only for writing the answer book.

1. Attempt **any three** of following.

a) Prove that $\sec^4 \theta \left(1 - \sin^4 \theta\right) - 2\tan^2 \theta = 1$ **4**

b) Area of circular sector of radius 12cm is 43.2 sq. cm find it's perimeter.   **4**

c) Evaluate $\lim\limits_{x \to 0} \dfrac{3\sin x - \sin 3x}{x^3}$ **4**

d) Evaluate $\lim\limits_{x \to \pi/2} \dfrac{1 - \sin x}{\left(\pi - 2x\right)^2}$ **4**

2. A) Evaluate **any two** of following.

a) Find $\dfrac{dy}{dx}$ if $y = x^x + 3^x + x^3 + 3^3$ **3**

b) Find $\dfrac{dy}{dx}$ if $y = \left(\sin x\right)^{\log x}$ **3**

c) Find $\dfrac{dy}{dx}$ if $x = a\cos^3 \theta \ \ y = a\sin^3 \theta$ **3**

B) Attempt **any one** of following.

a) If $f\left(x\right) = \dfrac{1 - \cos Kx}{x^2}$ when $x \neq 0$ **6**

        $= \dfrac{1}{2}$ when $x = 0$

is continuous at $x = 0$ then find K.

b) Examine the function for maxima & minima where $f\left(x\right) = x^3 - 6x^2 + 12x - 8$.   **6**

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3. Evaluate **any three** of following.

a) If $f(x) = \dfrac{x^4 - 64x}{\sqrt{x^2 + 9} - 5}$ for $x \neq 4$ **4**

$= 240$ for $x = 4$

is continuous or discontinuous at $x = 4$ check.

b) Find derivative of e^x by first principle w.r.t x.   **4**

c) $y = \sqrt{\sin \sqrt{x}}$ find $\dfrac{dy}{dx}$.   **4**

d) Evaluate $\displaystyle\int \dfrac{e^{4x} dx}{\left(e^{4x} + 5\right)^4}$ **4**

4. Evaluate **any two** of following.

a) Evaluate $\displaystyle\int_0^{\pi/2} \dfrac{1}{1 + \tan x}\, dx$ **6**

b) Find area of circle $x^2 + y^2 = a^2$ using definite integration.   **6**

c) Solve the D. E. $\dfrac{dy}{dx} = \left(\dfrac{e^x - e^{-x}}{e^x + e^{-x}}\right) y$ **6**

5. A) Attempt **any two** of following.

a) Form the differential equation by removing arbitrary constants from   **3**
$y = A e^{3x} + B e^{-3x}$

b) Three coins are tossed simultaneously find probability that of getting   **3**
i)   at most two tails.   ii)   at least two tails.

c) If $P(A') = \frac{1}{3}$ $P(B') = \frac{2}{5}$ find $P(A \cap B)$ when A & B are independent events.   **3**

B) Evaluate **any one** of following.

a) If $P(A') = 0.7$ $P(B) = 0.7$ $P\left(\frac{B}{A}\right) = \frac{1}{2}$ find $P(A/B)$ & $P(A \cup B)$.   **6**

b) If A & B are any two events from sample space S then prove that   **6**
i) $P(A \cup B) = P(A) + P(B) - P(A \cap B)$
ii) $P(A) + P(A') = 1$ where A & A' are complements of each other.

6. **A)** Write short notes on :

    a) Bar diagram.   **3**

    b) Pi diagram.   **3**

B) Attempt **any one** of following.

    a) Find mean, S. D. & coeff. of variation from data.   **6**

Class	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Frequency	8	15	22	15	8

    b) Find mean, mode & median from data.   **6**

Class	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Frequency	5	10	20	9	6	2

7. Attempt **any one** of following.

    a) Calculate the coeff. of correl^n between X & Y from the following data.   **12**

X	12	9	8	10	11	13	7
Y	14	8	6	9	11	12	3

    b) Find standard error S_y ie. error of estimation on y from following data.   **12**

X	54	58	52	46	49	51	57	53	40	50
Y	34	36	40	50	52	48	46	44	56	64

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