

QUESTION BANK

B.Sc. (Part I) (SEM – I) (NEP 2020) Subject: Mathematics (Paper - II)

Subject Code: 88176

Q1) Select the correct alternative for each of the following:

- a) The solution of $p(p - 1) = 0$ is _____
i) $(y - c)(y + x + c) = 0$ ii) $(y - c)(y + x - c) = 0$
iii) $(y - c)(y - x - c) = 0$ iv) $(y + c)(y + x + c) = 0$
- b) The complete solution of differential equation $(D^2 - 9D + 18)y = 0$ is _____
i) $y = c_1 e^{3x} + c_2 e^{6x}$ ii) $y = c_1 e^{-3x} + c_2 e^{6x}$
iii) $y = c_1 e^{3x} + c_2 e^{-6x}$ iv) None of these
- c) The equation $(2x + 3y + 1)dx + (3x + 2y + 1)dy = 0$ is differential equation. _____
i) Non-homogeneous ii) Homogeneous
iii) Linear iv) Exact
- d) The solution of the differential equation $p = (px - y)$ is _____
i) $y = cx + c$ ii) $y = cx - c$
iii) $y = cy + e^p$ iv) $y = cy + c$
- e) $\frac{1}{D^2} e^{2x} =$ _____
i) $\frac{1}{4} e^{2x}$ ii) $\frac{1}{2} e^{2x}$
iii) e^{2x} iv) $4e^{2x}$
- f) If $y = px + e^p$ then its solution is
i) $y = cx + e^p$ ii) $y = cx + e^c$
iii) $y = cx + p^c$ iv) $y = cx + c^e$
- g) The general solution of the differential equation $\frac{d^2 y}{dx^2} + B \frac{dy}{dx} + C = 0$ is _____ if its auxiliary equation has two roots $\alpha + i\beta$ and $\alpha - i\beta$
i) $y = [c_1 \cos \beta x + c_2 \sin \beta x] e^{\alpha x}$ ii) $y = [c_1 \cos \beta x + c_2 \sin \beta x] e^{\beta x}$
iii) $y = [c_1 \cos \alpha x + c_2 \sin \alpha x] e^{\beta x}$ iv) $y = [c_1 \cos \alpha x + c_2 \sin \alpha x] e^{\alpha x}$
- h) $D^2 \sin 2x =$ _____
i) $-4 \sin 2x$ ii) $-4 \sin 4x$
iii) $-4 \cos 4x$ iv) $-4 \cos 2x$

Q2) Solve the following

- a) Solve $\frac{dy}{dx} + xy = x^3 y^3$ using Bernoulli's equation.
- b) Solve: $(D^2 - 2D + 1)y = x e^x \sin x$
- c) State and prove necessary and sufficient condition for Exactness.
- d) Solve $\frac{d^3 y}{dx^3} - 6 \frac{d^2 y}{dx^2} + 11 \frac{dy}{dx} - 6y = 0$.
- e) Solve $p^2 - 7p + 12 = 0$.
- f) Solve $(\sin x \cos y + e^{2x})dx + (\cos x \sin y + \tan y)dy = 0$.
- g) Solve $\frac{1}{(D-2)(D+2)} e^{2x}$.
- h) Find the Particular Integral of $(D^3 - 3D + 2)y = x$.
- i) Find the Particular Integral of $(D^2 - 1)y = x$

