05/08_EM-II_FE_Sem II (R-19)_Inst Name

University of Mumbai

* Required

1. Email *

EM-II_PART-B

2. *

	The solution of DE $(e^x + 2xy^2 + y^3)dx + (2x^2y + 3xy^2)dy = 0$ is
Option A:	$e^x + x^2y^2 + xy^3 = k$
Option B:	$e^x - x^2y^2 + xy^3 = k$
Option C:	$e^x - x^2y^2 - xy^3 = k$
Option D:	$e^{-x} + x^2y^2 + xy^3 = k$

Mark only one oval.

- Option A:
- Option B:
- Option C:
- Option D:

3. *

The perimeter of the curve $r = a(1 + \cos\theta)$ is

Mark only one oval.

- a
- 2 a
- 8 a
- 4 a

4. *

	The Particular Integral of $(D^3 - D^2)y = x$ is
Option A:	$P.I = \left(\frac{x^6}{6} + \frac{x^2}{2}\right)$
Option B:	$P.I = -\left(\frac{x^6}{6} + \frac{x^2}{2}\right)$
Option C:	$P.I = \left(\frac{x^6}{6} - \frac{x^2}{2}\right)$
Option D:	$P.I = -\left(\frac{x^6}{6} - \frac{x^2}{2}\right)$

Mark only one oval.

- Option A:
- Option B:
- Option C:
- Option D:

5. *

	The Double integral $I = \int_{-3}^{2}\int_{2-y}^{5} f(x,y)\,dx\,dy + \int_{2}^{7}\int_{y-2}^{5} f(x,y)\,dx\,dy$ into a single term will be given by
Option A:	$I = \int_{0}^{5}\int_{2+x}^{2-x} f(x,y)\,dy\,dx$
Option B:	$I = \int_{0}^{5}\int_{2-x}^{2+x} f(x,y)\,dy\,dx$
Option C:	$I = \int_{0}^{5}\int_{0}^{2+x} f(x,y)\,dy\,dx$
Option D:	$I = \int_{0}^{5}\int_{0}^{2-x} f(x,y)\,dy\,dx$

Mark only one oval.

- Option A:
- Option B:
- Option C:
- Option D:

6. *

	The value of integral $I = \int_{0}^{\pi/2} \sqrt{\tan\theta}\; d\theta$ is
Option A:	$\frac{\pi}{\sqrt{2}}$
Option B:	$\pi\sqrt{2}$
Option C:	$\sqrt{\pi}$
Option D:	$\frac{\pi}{2}$

Mark only one oval.

- Option A:
- Option B:
- Option C:
- Option D:

7. *

	The triple integral $\iiint_v z^2 dx\,dydz$ is converted to cylindrical polar coordinates $\iiint_v g(r,\theta,z)\,dr\,d\theta dz$ over the volume bounded by the cylinder $x^2 + y^2 = a^2$ and the paraboloid $x^2 + y^2 = z$ and the plane z = 0, then the upper limit of z is
Option A:	2
Option B:	r^2
Option C:	1
Option D:	$\frac{r^2}{2}$

Mark only one oval.

- Option A:
- Option B:
- Option C:
- Option D:

8. *

	Solve $\frac{dy}{dx} + 2y\tan x = \sin x$ is given by
Option A:	$y\,sec^2x = secx + c$
Option B:	$y\,cos^2x = cosx + c$
Option C:	$y = secx + c$
Option D:	$y\,cos^2x = secx + c$

Mark only one oval.

- Option A:
- Option B:
- Option C:
- Option D:

9. *

	The Particular Integral of $(D^2-1)y = xsin\,3x$ is
Option A:	$\text{P I} = -\frac{1}{10}\left(xsin3x - \frac{3}{5}\cos 3x\right)$
Option B:	$\text{P I} = \frac{1}{10}\left(xsin3x - \frac{3}{5}\cos 3x\right)$
Option C:	$\text{P I} = -\frac{1}{10}\left(xsin3x + \frac{3}{5}\cos 3x\right)$
Option D:	$\text{P I} = \frac{1}{10}\left(xsin3x + \frac{3}{5}\cos 3x\right)$

Mark only one oval.

- Option A:
- Option B:
- Option C:
- Option D:

10. *

If $B(n,2) = \frac{1}{42}$ and n is a positive integer , then n =

Mark only one oval.

- 5
- 6
- 2
- 4

11. *

	The area bounded by $y = x^2$ and $x = y^2$ is given by
Option A:	$\frac{1}{2}$
Option B:	$\frac{1}{6}$
Option C:	1
Option D:	$\frac{1}{3}$

Mark only one oval.

- Option A:
- Option B:
- Option C:
- Option D:

12. *

	Find the value of $I = \int_5^6 (x-5)^5 (6-x)^6 \, dx$
Option A:	$B\left(3, \frac{7}{2}\right)$
Option B:	$B\left(3, \frac{5}{2}\right)$
Option C:	B(5,6)
Option D:	B(6,7)

Mark only one oval.

- Option A:
- Option B:
- Option C:
- Option D:

13. *

	The length of the curve $y = \log secx$, $from\ x = 0\ to\ x = \pi/_3$ is
Option A:	$\sqrt{3}$
Option B:	$\log(\sqrt{3})$
Option C:	$\log(2+\sqrt{3})$
Option D:	$2\sqrt{3}$

Mark only one oval.

- Option A:
- Option B:
- Option C:
- Option D:

14. *

	The Integrating factor of DE $(2xlog\ x - xy)dy + 2y\ dx = 0$ is
Option A:	I F= $\frac{1}{xy}$
Option B:	I F= $\frac{1}{x}$
Option C:	I F= $-\frac{1}{xy}$
Option D:	I F= - $\frac{1}{x}$

Mark only one oval.

- Option A:
- Option B:
- Option C:
- Option D:

15. *

After changing from cartesian to spherical polar coordinates the integral $\iiint_v \frac{z}{x^2+y^2+z^2} dx\, dydz$ reduces to $\iiint_v f(r,\theta,\varphi)\, dr\, d\theta d\varphi$, then $f(r,\theta,\varphi)$ is

Mark only one oval.

- rsin θ
- r cosθ
- sin θ cosθ
- rsin θ cosθ

16. *

	The solution of $(D^4 + 8D^2 + 16)y = 0$ is given by
Option A:	$y = (c_1 + c_2x)\cos 2x + (c_3 + c_4x)\sin 2x$
Option B:	$y = (c_1 + c_2x) + c_3x\cos 2x + c_4\sin 2x$
Option C:	$y = (c_1 + c_2) + c_3\cos 2x + c_4\sin 2x$
Option D:	$y = (c_1 + c_2x) + c_3\cos 2x + c_4\sin 2x$

Mark only one oval.

- Option A:
- Option B:
- Option C:
- Option D:

17. *

	The value of $I = \int_0^a \int_y^a x\, dx\, dy$, if evaluating in polar coordinate is
Option A:	$\frac{a^3}{3}$
Option B:	$\frac{a^3}{6}$
Option C:	$\frac{a^2}{3}$
Option D:	$\frac{a^2}{2}$

Mark only one oval.

- Option A:
- Option B:
- Option C:
- Option D:

18. *

	The Integrating factor of DE $\frac{dy}{dx} + (2x\, tan^{-1}y - x^3)(1 + y^2) = 0$ is given by
Option A:	I F= - e^{x^2}
Option B:	I F= $e^{x^2/2}$
Option C:	I F= $-e^{x^2/2}$
Option D:	I F= e^{x^2}

Mark only one oval.

- Option A:
- Option B:
- Option C:
- Option D:

19. *

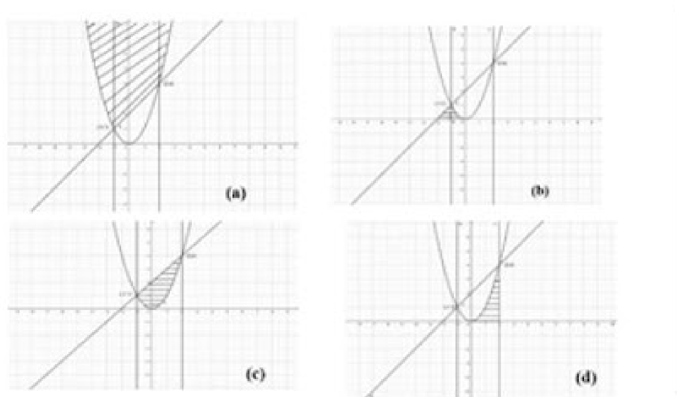
If $I = \int_0^1 \int_0^{g(x)} \int_0^{f(x,y)} dz\, dy\, dx$ is evaluated over the volume bounded by x+y+3z = 1, x=0, y=0 and z = 0 , then 3f(x,y) – g(x) is

Mark only one oval.

- 2x - y
- 4x - y
- -y
- 2

20. *

The region of integration for $I = \int_{-1}^{2} \int_{x^2}^{x+2} f(x,y)\, dy\, dx$ is given by



Mark only one oval.

- a
- b
- c
- d

21. *

	The Particular Integral of $(D+1)y = e^{e^x}$ is
Option A:	P I $=-e^{-x}\ e^{e^x}$
Option B:	P I $= e^{-x}\ e^{e^x}$
Option C:	P I $==-e^{x}\ e^{e^x}$
Option D:	P I $==e^{x}\ e^{e^x}$

Mark only one oval.

- Option A:
- Option B:
- Option C:
- Option D: