University of Mumbai

Examination 2020

Program: BE Engineering

Curriculum Scheme: Rev2016/2019

Examination First Year Semester II

Code: __FEC 201___ and Course Name: _Applied Mathematics II___

Time: 1 hour   Max. Marks: 50

For the students:- All the Questions are compulsory and carry equal marks .

Q1.	What is the order of the differential equation given by dy/dx+4y=sinx?
Option A:	0.5
Option B:	1
Option C:	2
Option D:	0
Q2.	What is the result of the integration $\int_3^{\ 4} \int_1^{\ 2} (x^2+y)dxdy$?
Option A:	83/6
Option B:	83/3
Option C:	82/6
Option D:	81/6
Q3.	Solution of the differential equation $\sec^2x$ tany dx + $\sec^2$ y tanx dy=0 is _____
Option A:	(sec x sec y)=k
Option B:	(sec x .tany)=k
Option C:	(tan x. tany)=k
Option D:	(sec x .tan x)+(sec y .tan y)=k
Q4.	The integral value of $\iiint$rdrdθdz is _____where range of r,θ ,z are 0 to r , 0 to asinθ, 0 to Π/2.
Option A:	0.5
Option B:	0.25
Option C:	1
Option D:	0
Q5.	C.F. of $(D^2 -1)y= 0$ is y =

Option A:	$c_1 \cos(x) + c_2 \sin(x)$
Option B:	$c_1 \cos(x) - c_2 \sin(x)$
Option C:	$c_1 e^x + c_2 e^{-x}$
Option D:	$c_1 e^x - c_2 e^{-x}$
Q6.	Ans. $\overline{35}$ 11. Evaluate $\int_0^\infty \int_0^\infty \int_0^\infty \dfrac{dx\,dy\,dz}{(1+x^2+y^2+z^2)^2}$ using spherical coordinates. Ans
Option A:	$x^2/8$
Option B:	$-x^2/7$
Option C:	$x^2/6$
Option D:	$x^2/9$
Q7.	dy /dx +Py =Q this is Standard form of ......
Option A:	Linear Differential equation
Option B:	Exact Differential equation
Option C:	Homogeneous Differential equation
Option D:	Non-Exact Differential equation
Q8.	Volume of an object expressed in spherical coordinates is given by $V=\int_0^{2\pi}\int_0^{\pi/3}\int_0^1 r\cos\emptyset \, dr\,d\emptyset \, d\theta$. The value of the integral is _____
Option A:	$\sqrt{3}/2$
Option B:	$1/\sqrt{2}\,\pi$)
Option C:	$\sqrt{3}/2\,\pi$
Option D:	$\sqrt{3}/4\,\pi$
Q9.	Rectification is determining _____
Option A:	Length of a line
Option B:	Length of a curve
Option C:	Area of an object
Option D:	Perimeter of an object
Q10.	A racer accelerates from a stop so that its speed is 10 m/s t second after starting how far will the car go in 4 seconds?
Option A:	80m
Option B:	60m
Option C:	40m
Option D:	160m
Q11.	Mdx +Ndy =0 is exact D.E. if ......
Option A:	$M_y = N_x$
Option B:	$M_y = -N_x$
Option C:	$M_x = N_y$
Option D:	$M_x = -N_y$

Q12.	The process of formation of the differential equation is given in the wrong order, select the correct option from below given options. 1) Eliminate the arbitrary constants. 2) Differential equation which involves x,y,dydx 3) Differentiating the given equation w.r.t x as many times as the number of arbitrary constants.
Option A:	1,2,3
Option B:	3,2,1
Option C:	3,1,2
Option D:	2,1,3
Q13.	Solution of the differential equation xydy/dx=1+x+y+xy is _____
Option A:	(y-x)-log(x(1+y))=c
Option B:	log(x(1+y))=c
Option C:	(y+x)-log(x)=c
Option D:	(y-x)-log(y(1+x))=c
Q14.	What is the value of $\Gamma(1/2)$?
Option A:	$\sqrt{(\pi)}$
Option B:	$2\sqrt{(\pi)}$
Option C:	$(\pi\sqrt{2})$
Option D:	π^2
Q15.	The length of curve $r = e\theta$, θ value ranges between 0 to π is_____
Option A:	$2-\sqrt{(2)}$
Option B:	$\sqrt{2}(e^2\pi-1)^{1/2}$
Option C:	$2(e^2\pi+1)^{1/2}$
Option D:	$2\sqrt{(e^2\pi)}$
Q16.	Find the Particular integral solution of the D.E. $(D^2 - 4D + 3)y = 20 \cos x$ by the method of undetermined coefficients.
Option A:	Yp = 4 cosx – 3 sinx
Option B:	yp = 2 sinx – 4 cosx
Option C:	yp = – 3 cosx + 4 sinx
Option D:	yp = 2 cosx – 4 sinx
Q17.	r =3acos(θ) represent
Option A:	Circle
Option B:	Straight line
Option C:	Parabola
Option D:	Cardioid
Q18.	Find the value of $\iint xydxdy$ over the area bounded by parabola x = 2a and $x^2 = 4ay$, is?
Option A:	a4⁄4

Option B:	a4/3
Option C:	a5/3
Option D:	a2/3
Q19.	Solution of differential equation $xy' - y = x^3$ is
Option A:	$y - x^3 = 2cx$
Option B:	$y + x^3 = 2cx$
Option C:	$2y + x^3 = 2cx$
Option D:	$2y - x^3 = 2cx$
Q20.	4. Evaluate $\int\limits_{0}^{\infty}\int\limits_{x}^{\infty}\dfrac{e^{-y}}{y}dx.dy$
Option A:	1
Option B:	2
Option C:	3
Option D:	4
Q21.	$\Gamma(n+1) = n!$ can be used when _____
Option A:	n is any integer
Option B:	n is a positive integer
Option C:	n is a negative integer
Option D:	n is any real number
Q22.	Find the $\iint x^3\, y^3\, \sin(x)\sin(y)\, dxdy$.
Option A:	$(x^3\, Cos(x) + 3x^2\, Sin(x) + 6xCos(x)-6Sin(x))(y^3Cos(y) + 3[y^2\, Sin(y) - 2[-yCos(y) + Sin(y)]])$
Option B:	$(-x^3\, Cos(x) - 3x^2\, Sin(x) - 6xCos(x)-6Sin(x))(-y^3Cos(y) + 3[y^2\, Sin(y) - 2[-yCos(y) + Sin(y)]])$
Option C:	$(-x^3\, Cos(x) + 3x^2Sin(x) + 6xCos(x)-6Sin(x))(-y^3\, Cos(y) + 3y^2\, Sin(y) + 6yCos(y) - 6Sin(y))$
Option D:	$(-x^3\, Cos(x) + 6xCos(x) - 6Sin(x))(-y^3Cos(y))$
Q23.	The integral value of $\int_{0}^{1}\int_{0}^{1}\int_{0}^{x} x^{+}\, {}^{\alpha}e^{x+}\, {}^{\alpha+}\, {}^{n}dnd\alpha dx$ is given by _____
Option A:	$=13(e^4 +6e^2+8e+3)$
Option B:	$=13(e^4 -6e^2+4e+3)$
Option C:	$=18(e^4 -6e^2+8e-3)$
Option D:	0
Q24.	Given the differential equation $dy/dx=x^4 -y^4 /(x^2+y^2)xy$ the degree of differential equation is _____

Option A:	1
Option B:	4
Option C:	0
Option D:	2
Q25.	Solution of the D.E $y'' + 3y' + 2y = 12x^2$ when solved using the method of undetermined coefficients is _____
Option A:	$y = c_1 e^x + c_2 e^{2x} + 2 - 11x + x^2$
Option B:	$y = c_1 e^{-x} + c_2 e^{-2x} + 18 + 21x + 3x^2$
Option C:	$y = c_1 e^x + c_2 e^{-2x} + 11 + 18x + 2x^2$
Option D:	$y = c_1 e^{-x} + c_2 e^{-2x} + 21 - 18x + 6x^2$