

# NADAR SARASWATHI COLLEGE OF ENGINEERING AND TECHNOLOGY, THENI.

Course/Branch :B.E/EEE	Year / Semester :II/III	Format No.	NAC/TLP-07a.13
Subject Code :EE8391	Subject Name :Electromagnetic Theory	Rev. No.	02
Unit No :1	Unit Name :Electrostatics-I	Date	30.09.2020

## OBJECTIVE TYPE QUESTION BANK

S. No.	Objective Questions (MCQ /True or False / Fill up with Choices )	BTL
1	The force between two charges is 120 N. If the distance between the charges is doubled, the force will be (a) 60 N <b>(b) 30 N</b> (c) 40 N (d) 15 N	L2
2	The electric field intensity at a point situated 4 metres from a point charge is 200 N/C. If the distance is reduced to 2 metres, the field intensity will be (a) 400 N/C (b) 600 N/C <b>(c) 800 N/C</b> (d) 1200 N/C	L2
3	The lines of force due to charged particles are (a) always straight <b>(b) always curved</b> (c) sometimes curved (d) none of the above	L1
4	The electric field at a point situated at a distance d from straight charged conductor is (a) proportional to d <b>(b) inversely proportional to d</b> (c) inversely proportional to $d^2$ (d) none of the above	L1
5	Divergence of gradient of a vector function is equivalent to a) <b>Laplacian operation</b> b) Curl operation c) Double gradient operation d) Null vector	L1
6.	Find the gradient of $t = x^2y + e^z$ at the point p(1,5,-2) a) $i + 10j + 0.135k$ b) <b><math>10i + j + 0.135k</math></b> c) $i + 0.135j + 10k$ d) $10i + 0.135j + k$	L3
7.	Find whether the vectors are parallel, (-2,1,-1) and (0,3,1) a) Parallel b) Collinearly parallel c) <b>Not parallel</b> d) Data insufficient	L1
8.	The spherical equivalent of the vector $B = yi + (x + z)j$ located at (-2,6,3) is given by a) (7,64.62,71.57) b) (7,-64.62,-71.57) c) (7,-64.62,71.57) d) <b>(7,64.62,-71.57)</b>	L3
9.	Find the force between 2C and -1C separated by a distance 1m in air(in newton).	L2

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	a) $18 \times 10^6$ <b>b) <math>-18 \times 10^6</math></b> c) $18 \times 10^{-6}$ d) $-18 \times 10^{-6}$	
10.	Find the force between two charges when they are brought in contact and separated by 4cm apart, charges are 2nC and -1nC, in $\mu\text{N}$ . a) 1.44 b) 2.44 c) 1.404 <b>d) 2.404</b>	L4
11.	The Coulomb law is an implication of which law? a) Ampere law <b>b) Gauss law</b> c) Biot Savart law d) Lenz law	L1
12.	A charge of $2 \times 10^{-7} \text{ C}$ is acted upon by a force of 0.1N. Determine the distance to the other charge of $4.5 \times 10^{-7} \text{ C}$ , both the charges are in vacuum. a) 0.03 b) 0.05 c) 0.07 <b>d) 0.09</b>	L2
13.	What is the electric field intensity at a distance of 20cm from a charge $2 \times 10^{-6} \text{ C}$ in vacuum? a) 250,000 b) 350,000 <b>c) 450,000</b> d) 550,000	L3
14.	Electric field intensity due to infinite sheet of charge $\sigma$ is a) Zero b) Unity c) $\sigma/\epsilon$ <b>d) <math>\sigma/2\epsilon</math></b>	L1
15.	A circular disc of radius 5m with a surface charge density $\rho_s = 10\sin\phi$ is enclosed by surface. What is the net flux crossing the surface? a) 3 b) 2 c) 1 <b>d) 0</b>	L2
16.	The potential of a coaxial cylinder with charge density 1 unit , inner radius 1m and outer cylinder 2m is (in $10^9$ ) a) 12.74 b) 13.47 <b>c) 12.47</b> d) 13.74	L3
17.	Gauss law for magnetic fields is given by a) $\text{Div}(\mathbf{E}) = 0$	L3

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	<p><b>b) Div(B) = 0</b>                  c) Div(H) = 0                  d) Div(D) = 0</p>	
18.	<p>An electric field is given as <math>E = 6y^2z \mathbf{i} + 12xyz \mathbf{j} + 6xy^2 \mathbf{k}</math>. An incremental path is given by <math>d\mathbf{l} = -3 \mathbf{i} + 5 \mathbf{j} - 2 \mathbf{k}</math> mm. The work done in moving a 2mC charge along the path if the location of the path is at p(0,2,5) is (in Joule)</p> <p>a) 0.64  <b>b) 0.72</b>                  c) 0.78                  d) 0.80</p>	L3
19.	<p>A field in which a test charge around any closed surface in static path is zero is called</p> <p>a) Solenoidal                  b) Rotational                  c) Irrotational  <b>d) Conservative</b></p>	L1
20.	<p>Which of the following theorem convert line integral to surface integral?</p> <p>a) Gauss divergence and Stoke's theorem                  b) Stoke's theorem only                  c) Green' s theorem only  <b>d) Stoke's and Green's theorem</b></p>	L1
21.	<p>The electric flux density and electric field intensity have which of the following relation?</p> <p><b>a) Linear</b>                  b) Nonlinear                  c) Inversely linear                  d) Inversely nonlinear</p>	L2
22.	<p>Find the electric flux density surrounding a material with field intensity of <math>2xyz</math> placed in transformer oil (<math>\epsilon_r = 2.2</math>) at the point P(1,2,3) is (in <math>10^{-10}</math> units)</p> <p>a) 2.1                  b) 2.33  <b>c) 2.5</b>                  d) 2.77</p>	L3
23.	<p>Find the work done moving a charge 2C having potential <math>V = 24</math>volts is</p> <p>a) 96                  b) 24                  c) 36  <b>d) 48</b></p>	L1
24.	<p>Example of spherical system in the following is</p> <p><b>a) Charge in space</b>                  b) Charge in box                  c) Charge in dielectric                  d) Uncharged system</p>	L1
25.	<p>Choose which of following condition is not required for a waveguide to exist.</p> <p>a) The dimensions should be in accordance with desired frequency                  b) Cut-off frequency should be minimum 6GHz  <b>c) The shape should be spherical</b></p>	L2

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	d) No specific condition is required for waveguide design	
26	Find the Cartesian coordinates of B(4,25 <sup>0</sup> ,120 <sup>0</sup> ) a) (0.845, 1.462, 3.625) <b>b) (-0.845, 1.462, 3.625)</b> c) (-8.45, 2.462, 6.325) d) (8.45, 2.462, 6.325)	L3
27.	The resistance of a material with conductivity 2millimho/m <sup>2</sup> , length 10m and area 50m is a) 500 b) 200 <b>c) 100</b> d) 1000	L2
28.	Find the current in a conductor with resistance 2 ohm, electric field 2 units and distance 100cm. <b>a) 1A</b> b) 10mA c) 10A d) 100mA	L3
29.	Gauss law can be used to compute which of the following? a) Permittivity b) Permeability <b>c) Radius of Gaussian surface</b> d) Electric potential	L1
30.	Three charged cylindrical sheets are present in three spaces with $\sigma = 5$ at R = 2m, $\sigma = -2$ at R = 4m and $\sigma = -3$ at R = 5m. Find the flux density at R = 3m. a) 3 <b>b) 10/3</b> c) 11/3 d) 4	L2
31.	Gauss law can be evaluated in which coordinate system? a) Cartesian b) Cylinder c) Spherical <b>d) Depends on the Gaussian surface</b>	L1
32.	In free space, the Poisson equation becomes a) Maxwell equation b) Ampere equation <b>c) Laplace equation</b> d) Steady state equation	L1

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