DSSSB
JE & SO

Previous Year Paper
(Electrical)
04 Mar, 2024 Shift 1

GOVT. OF NCT OF DELHI
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Participant ID	
Participant Name	
Test Center Name	
Test Date	04/03/2024
Test Time	9:00 AM - 12:00 PM
Subject	Junior Engineer (Electrical) and Section Officer (Electrical)

Section : **Section A1**

Q.1 Consider a body of mass 10 kg is moving under a force, the relation between time and displacement is given as $x=t^2/4$, where x is expressed in metres and t is in seconds. What is the work done in the first 2 seconds?

Ans
✗ 1. 6 J
✗ 2. 3 J
✓ 3. 5 J
✗ 4. 4 J

Question ID : **630680648214**
Option 1 ID : **6306802538062**
Option 2 ID : **6306802538059**
Option 3 ID : **6306802538061**
Option 4 ID : **6306802538060**

Q.2 In a geometric progression, the sum of the first and last terms is 64 and the product of the second and the last but one term is 124. The first term of the series is:

Ans
✗ 1. 62
✗ 2. 42
✗ 3. 2 or 42
✓ 4. 2 or 62

Question ID : **630680648219**
Option 1 ID : **6306802538079**
Option 2 ID : **6306802538082**
Option 3 ID : **6306802538081**
Option 4 ID : **6306802538080**

Q.3 Let AC and BD be two chords in a circle with centre O such that AB and CD intersect at a point. If $\angle BAC : \angle ABC = 2 : 4$, then $\angle BAC = ?$

Ans
1. $30°$
2. $10°$
3. $90°$
4. $60°$

Question ID : **630680648222**
Option 1 ID : **6306802538092**
Option 2 ID : **6306802538091**
Option 3 ID : **6306802538094**
Option 4 ID : **6306802538093**

Q.4 If A, B and C are skew-symmetric matrices of the same order, then ABC + CBA is a/an:

Ans
1. skew-symmetric matrix
2. symmetric matrix
3. zero matrix
4. identity matrix

Question ID : **630680648221**
Option 1 ID : **6306802538090**
Option 2 ID : **6306802538088**
Option 3 ID : **6306802538089**
Option 4 ID : **6306802538087**

Q.5 Consider an equilateral triangle of side L. The centre of gravity of the triangle measured on a median from any side lies at a height:

Ans
1. $\frac{L}{2\sqrt{3}}$
2. $\frac{L}{\sqrt{3}}$
3. $\frac{2L}{\sqrt{3}}$
4. $\frac{\sqrt{3}L}{2}$

Question ID : **630680648217**
Option 1 ID : **6306802538072**
Option 2 ID : **6306802538074**
Option 3 ID : **6306802538071**
Option 4 ID : **6306802538073**

Q.6 The value of the integral $\int e^x \left(\frac{2+\sin 2x}{1+\cos 2x}\right) dx$ is (C is arbitrary constant):

Ans
1. $e^x \sin x + C$
2. $e^x \sec x + C$
3. $e^x \cos x + C$
4. $e^x \tan x + C$

Question ID : **630680648226**
Option 1 ID : **6306802538109**
Option 2 ID : **6306802538107**
Option 3 ID : **6306802538108**
Option 4 ID : **6306802538110**

Q.7 In a hydrogen atom, transition takes place from n = 3 to n = 2 orbit. The wavelength of the emitted radiation lies in the:

Ans
1. X-ray region
2. UV region
3. infrared region
4. visible region

Question ID : **630680648211**
Option 1 ID : **6306802538048**
Option 2 ID : **6306802538047**
Option 3 ID : **6306802538050**
Option 4 ID : **6306802538049**

Q.8 Match the Gaseous Fuels with their Calorific Values.

	Gaseous Fuel		Calorific Value (kcal/m^3)
(i)	Producer gas	(a)	4,900
(ii)	Natural gas	(b)	900 – 1,300
(iii)	Water gas	(c)	8,000 – 14,000
(iv)	Coal gas	(d)	2,800

Ans
1. (i) - (c); (ii) - (b); (iii) - (a); (iv) - (d)
2. (i) - (b); (ii) - (c); (iii) - (a); (iv) - (d)
3. (i) - (c); (ii) - (d); (iii) - (b); (iv) - (a)
4. (i) - (b); (ii) - (c); (iii) - (d); (iv) - (a)

Question ID : **630680648196**
Option 1 ID : **6306802537987**
Option 2 ID : **6306802537989**
Option 3 ID : **6306802537990**
Option 4 ID : **6306802537988**

Q.9 What does the given formula represent?

$$\frac{\text{Weight of solute}}{\text{Equivalent weight of solute} \times \text{Volume of the solution}}$$

Ans
1. Formality
2. Normality
3. Molality
4. Molarity

Question ID : **630680648192**
Option 1 ID : **6306802537973**
Option 2 ID : **6306802537974**
Option 3 ID : **6306802537972**
Option 4 ID : **6306802537971**

Q.10 The solution of $y + (x - cosy)\frac{dy}{dx} = 0$ is (C is arbitrary constant):

Ans
1. $y - cosy = C$
2. $y + cosy = C$
3. $xy - siny = C$
4. $xy + siny = C$

Question ID : **630680648227**
Option 1 ID : **6306802538114**
Option 2 ID : **6306802538113**
Option 3 ID : **6306802538112**
Option 4 ID : **6306802538111**

Q.11 The magnitude of the magnetic force on a wire of length 6 m carrying a current of 8 A and making an angle of 45° with the direction of a uniform magnetic field of 0.25 T is:

Ans
1. $4\sqrt{2}\ N$
2. $8\sqrt{2}\ N$
3. $2\sqrt{2}\ N$
4. $6\sqrt{2}\ N$

Question ID : **630680648207**
Option 1 ID : **6306802538032**
Option 2 ID : **6306802538034**
Option 3 ID : **6306802538031**
Option 4 ID : **6306802538033**

Q.12 If the torque acting on a rigid body is zero, then the angular momentum of the rigid body:

Ans

✗ 1. becomes indefinite

✗ 2. becomes infinite

✓ 3. remains constant

✗ 4. changes at a constant rate

Question ID : **630680648216**
Option 1 ID : **6306802538070**
Option 2 ID : **6306802538069**
Option 3 ID : **6306802538067**
Option 4 ID : **6306802538068**

Q.13 Select the option that is correct regarding the following two statements labelled Assertion (A) and Reason (R).

(A): Sheets of Zinc protect ship hull from corrosion

(R): Zinc being less active than ship's metal is used as sacrificial anode.

Ans

✗ 1. Both A and R are true, and R is the correct explanation of A

✗ 2. A is false but R is true

✓ 3. A is true but R is false

✗ 4. Both A and R are true, but R is not the correct explanation of A

Question ID : **630680648198**
Option 1 ID : **6306802537995**
Option 2 ID : **6306802537998**
Option 3 ID : **6306802537997**
Option 4 ID : **6306802537996**

Q.14 The value of the limit $\lim_{x \to 0} \frac{\sin 3x - 3 \sin x}{x^3}$

Ans

✗ 1. 4

✓ 2. -4

✗ 3. -3

✗ 4. 3

Question ID : **630680648224**
Option 1 ID : **6306802538102**
Option 2 ID : **6306802538099**
Option 3 ID : **6306802538100**
Option 4 ID : **6306802538101**

Q.15 A water sample contains 25 mg/L $CaSO_4$; 15 mg/L $CaCl_2$; 10 mg/L $Ca(HCO_3)_2$. The temporary and permanent hardness for the water under analysis, respectively, are:

Ans

✗ 1. 31.88 ppm and 6.17 ppm

✗ 2. 6.17 ppm and 18.38 ppm

✗ 3. 13.5 ppm and 6.17 ppm

✓ 4. 6.17 ppm and 31.88 ppm

Question ID : **630680648195**
Option 1 ID : **6306802537985**
Option 2 ID : **6306802537984**
Option 3 ID : **6306802537983**
Option 4 ID : **6306802537986**

Q.16 Rambabu is moving down a block of mass M on a rough inclined plane of angle of inclination δ and the coefficient of friction of the plane varies with distance x as $\mu(x) = \beta x^{0.5}$ where β is constant. Here x is the distance moved by the body down the plane. The net acceleration on the body is g cos δ at x = L. Then the value of constant β is:

Ans

✗ 1. $\cot \delta / L^{0.5} + 1$

✗ 2. $\cot \delta / L^{0.5} - 1$

✗ 3. $\tan \delta / L^{0.5} + 1$

✓ 4. $\tan \delta / L^{0.5} - 1$

Question ID : **630680648215**
Option 1 ID : **6306802538066**
Option 2 ID : **6306802538064**
Option 3 ID : **6306802538065**
Option 4 ID : **6306802538063**

Q.17 If two charges of 1 C are placed at a distance of 10 m in the free space, then the electrostatic force between them is:

Ans

✗ 1. $7 \times 10^9\ N$

✗ 2. $9 \times 10^9\ N$

✗ 3. $7 \times 10^7\ N$

✓ 4. $9 \times 10^7\ N$

Question ID : **630680648202**
Option 1 ID : **6306802538011**
Option 2 ID : **6306802538012**
Option 3 ID : **6306802538013**
Option 4 ID : **6306802538014**

Q.18 The value of i^i is:

Ans

✗ 1. $e^{\frac{\pi}{2}i}$

✗ 2. $e^{-\frac{\pi}{2}i}$

✓ 3. $e^{-\frac{\pi}{2}}$

✗ 4. $e^{\frac{\pi}{2}}$

Question ID : **630680648228**
Option 1 ID : **6306802538117**
Option 2 ID : **6306802538116**
Option 3 ID : **6306802538118**
Option 4 ID : **6306802538115**

Q.19 In a p-n junction semiconductor diode, one experiences increased barrier height and a wide depletion region:

Ans

✗ 1. when it is in a forward-biased condition

✗ 2. when the p-n junction diode is connected to a galvanometer

✗ 3. when the p-n junction diode is connected to a AC source

✓ 4. when it is in a reverse-biased condition

Question ID : **630680648208**
Option 1 ID : **6306802538036**
Option 2 ID : **6306802538035**
Option 3 ID : **6306802538038**
Option 4 ID : **6306802538037**

Q.20 A golfer hits a golf ball of mass 40.0 g and it moves with a speed of 20.0 m/s. If the golf stick is in contact with the ball for 2s, then the force applied by the golf stick on the ball is:

Ans

✓ 1. 0.4 N

✗ 2. 0.6 N

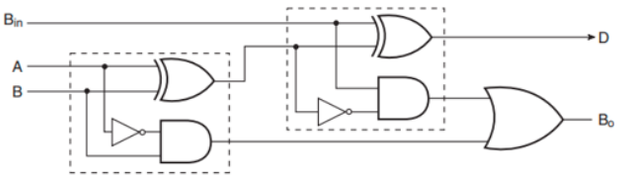
✗ 3. 0.8 N

✗ 4. 0.2 N

Question ID : **630680648212**
Option 1 ID : **6306802538052**
Option 2 ID : **6306802538053**
Option 3 ID : **6306802538054**
Option 4 ID : **6306802538051**

Section : **Section A2**

Q.1



The combinational logic circuit shown in the above figure performs logic implementation of the:

Ans
✗ 1. half adder
✗ 2. full adder
✗ 3. half subtractor
✓ 4. full subtractor

Question ID : **630680648370**
Option 1 ID : **6306802538683**
Option 2 ID : **6306802538684**
Option 3 ID : **6306802538685**
Option 4 ID : **6306802538686**

Q.2 Which of the following is NOT one of the applications of a cycloconverter?

Ans
✓ 1. Control of transient response
✗ 2. Speed control of high-power AC drives
✗ 3. Induction heating
✗ 4. Static VAR generation

Question ID : **630680648406**
Option 1 ID : **6306802538827**
Option 2 ID : **6306802538829**
Option 3 ID : **6306802538828**
Option 4 ID : **6306802538830**

Q.3

What should be the length 'X' shown by the thick cutting plane line in the above figure?

Ans
✗ 1. 0.15 mm
✗ 2. 0.5 mm
✗ 3. 0.125 mm
✓ 4. 0.25 mm

Question ID : **630680648352**
Option 1 ID : **6306802538612**
Option 2 ID : **6306802538614**
Option 3 ID : **6306802538611**
Option 4 ID : **6306802538613**

Q.4 **Which of the following systems provides less voltage fluctuations at consumer's terminal?**

Ans ✔ 1. Ring mains system of distribution provides less voltagefluctuations at consumer 's terminal.

✘ 2. Both radial and ring mains system of distribution provides more voltagefluctuations at consumer's terminal.

✘ 3. Radial system of distribution provides less voltagefluctuations at consumer 's terminal.

✘ 4. Both radial and ring mains system of distribution provides less voltagefluctuations at consumer's terminal.

Question ID : **630680648490**
Option 1 ID : **6306802539163**
Option 2 ID : **6306802539166**
Option 3 ID : **6306802539164**
Option 4 ID : **6306802539165**

Q.5 **Which of the following statements is true?**

Ans ✘ 1. A loop will also be a mesh but a mesh may not be a loop.

✔ 2. A loop may contain any number of meshes.

✘ 3. A mesh may contain any number of loops.

✘ 4. A mesh may contain maximum two loops.

Question ID : **630680648464**
Option 1 ID : **6306802539062**
Option 2 ID : **6306802539059**
Option 3 ID : **6306802539060**
Option 4 ID : **6306802539061**

Q.6 Which of the following material is used in the manufacture of low-current fuses?

Ans ✘ 1. Lead

✘ 2. Nickel

✘ 3. Carbon

✔ 4. Tin

Question ID : **630680648356**
Option 1 ID : **6306802538629**
Option 2 ID : **6306802538628**
Option 3 ID : **6306802538630**
Option 4 ID : **6306802538627**

Q.7 A 4-pole, 450 V DC shunt motor has 600 wave-connected conductors on its armature. The full-load armature current is 50 A and the flux per pole is 0.044 Wb. The armature resistance including brush contact is 0.2 Ω. Calculate the full-load speed of the motor.

Ans

✔ 1. 500 RPM

✘ 2. 850 RPM

✘ 3. 670 RPM

✘ 4. 450 RPM

Question ID : **630680648396**
Option 1 ID : **6306802538788**
Option 2 ID : **6306802538790**
Option 3 ID : **6306802538789**
Option 4 ID : **6306802538787**

Q.8 **Which of the following statements is correct regarding BJT?**

Ans

✘ 1. It is a two terminal active element.

✘ 2. It is majority carrier device.

✔ 3. Its operation involves both majority as well as minority charges.

✘ 4. It is minority carrier device.

Question ID : **630680648441**
Option 1 ID : **6306802538970**
Option 2 ID : **6306802538967**
Option 3 ID : **6306802538969**
Option 4 ID : **6306802538968**

Q.9 For a DC series motor, the torque is proportional to which of the following? (I_a = armature current)

Ans

✔ 1. $(I_a)^2$

✘ 2. $(1/I_a)^2$

✘ 3. $1/I_a$

✘ 4. I_a

Question ID : **630680648470**
Option 1 ID : **6306802539084**
Option 2 ID : **6306802539086**
Option 3 ID : **6306802539085**
Option 4 ID : **6306802539083**

Q.10 The output signal of which of the following pins in 8085 microprocessors can be used as a system clock for devices on the board?

Ans

✔ 1. Pin 37

✘ 2. Pin 35

✘ 3. Pin 27

✘ 4. Pin 29

Question ID : **630680648373**
Option 1 ID : **6306802538698**
Option 2 ID : **6306802538697**
Option 3 ID : **6306802538695**
Option 4 ID : **6306802538696**

Q.11 In a common-base transistor, I_E and I_B are found to be 2.5 mA and 50 µA, respectively. Compute the value of 'α'.

Ans

✔ 1. 0.98

✘ 2. 0.89

✘ 3. 0.93

✘ 4. 0.95

Question ID : **630680648365**
Option 1 ID : **6306802538663**
Option 2 ID : **6306802538666**
Option 3 ID : **6306802538665**
Option 4 ID : **6306802538664**

Q.12 In a DC generator, how can the induced EMF be increased?

Ans

✘ 1. By decreasing the field current

✘ 2. By increasing the field resistance

✘ 3. By decreasing the speed

✔ 4. By increasing the speed

Question ID : **630680648503**
Option 1 ID : **6306802539218**
Option 2 ID : **6306802539217**
Option 3 ID : **6306802539216**
Option 4 ID : **6306802539215**

Q.13 What is the plant utilisation factor for a general power plant?

Ans

1. $\frac{\text{Plant capacity}}{\text{Maximum demand}}$
2. $\frac{\text{Maximum demand}}{\text{Plant capacity}}$
3. $\frac{\text{Average demand}}{\text{Plant capacity}}$
4. $\frac{\text{Plant capacity}}{\text{Average demand}}$

Question ID : **630680648461**
Option 1 ID : **6306802539048**
Option 2 ID : **6306802539047**
Option 3 ID : **6306802539049**
Option 4 ID : **6306802539050**

Q.14 Which of the following quantities is measured in VAr (Volt-Ampere-Reactive)?

Ans

1. Instantaneous power
2. Reactive power
3. Active power
4. Apparent power

Question ID : **630680648498**
Option 1 ID : **6306802539198**
Option 2 ID : **6306802539196**
Option 3 ID : **6306802539195**
Option 4 ID : **6306802539197**

Q.15 Pressure cables are used when:

Ans

1. voltage is less than 33 kV
2. voltage is more than 33 kV
3. voltage is more than 66 kV
4. voltage is less than 66 kV

Question ID : **630680648491**
Option 1 ID : **6306802539167**
Option 2 ID : **6306802539169**
Option 3 ID : **6306802539170**
Option 4 ID : **6306802539168**

Q.16 **Which of the following is NOT true regarding a half adder?**

Ans
✗ 1. It generates two outputs, which are sum and carry.
✗ 2. It does not consider carry from previous stage.
✗ 3. It adds two bits.
✓ 4. It generates one output, which is sum of two bits.

Question ID : **630680648446**
Option 1 ID : **6306802538988**
Option 2 ID : **6306802538990**
Option 3 ID : **6306802538987**
Option 4 ID : **6306802538989**

Q.17 Extra high-tension (EHT) cables are meant to be used for voltages ranging:

Ans
✗ 1. from 22 kV to 33 kV
✗ 2. from 132 kV to 450 kV
✗ 3. from 66 kV to 132 kV
✓ 4. from 33 kV to 66 kV

Question ID : **630680648420**
Option 1 ID : **6306802538883**
Option 2 ID : **6306802538886**
Option 3 ID : **6306802538885**
Option 4 ID : **6306802538884**

Q.18 **Which of the following statements is NOT correct regarding tungsten?**

Ans
✓ 1. It has very low boiling point.
✗ 2. It has very high melting point.
✗ 3. It is used as lamp filament.
✗ 4. It is also called Wolfram.

Question ID : **630680648433**
Option 1 ID : **6306802538938**
Option 2 ID : **6306802538936**
Option 3 ID : **6306802538937**
Option 4 ID : **6306802538935**

Q.19 The eccentricity of a hyperbola is always:

Ans
✗ 1. > 0.5
✗ 2. < 1
✗ 3. < 0.5
✓ 4. > 1

Question ID : **630680648355**
Option 1 ID : **6306802538625**
Option 2 ID : **6306802538624**
Option 3 ID : **6306802538623**
Option 4 ID : **6306802538626**

Q.20 What will be the equation for a sinusoidal current of 50 Hz frequency with an RMS value of 10 A?

Ans

✗ 1. $i = 7.07 \sin 314t$

✓ 2. $i = 14.14 \sin 314t$

✗ 3. $i = 7.07 \sin 157t$

✗ 4. $i = 14.14 \sin 157t$

Question ID : **630680648388**
Option 1 ID : **6306802538756**
Option 2 ID : **6306802538758**
Option 3 ID : **6306802538755**
Option 4 ID : **6306802538757**

Section : **Section A3**

Q.1 **How can one get incremental cost curve from cost curve?**

Ans

✗ 1. By multiplying cost curve with total generation

✗ 2. By integrating cost curve

✓ 3. By differentiating cost curve

✗ 4. By dividing cost curve from total generation

Question ID : **630680648462**
Option 1 ID : **6306802539054**
Option 2 ID : **6306802539052**
Option 3 ID : **6306802539051**
Option 4 ID : **6306802539053**

Q.2 Which of the following statements pertaining to different modes of the 8255 microprocessor is/are true?

A. In mode 0, Port A can be set up for bidirectional data transfer by using handshake signals from Port C, whereas Port B can be set up either in mode 0 or in mode 1.

B. In mode 1, Port A and/or Port B use bits from Port C as handshake signals.

Ans

✗ 1. Both A and B are true

✗ 2. Both A and B are false

✗ 3. Only A is true

✓ 4. Only B is true

Question ID : **630680648374**
Option 1 ID : **6306802538701**
Option 2 ID : **6306802538702**
Option 3 ID : **6306802538699**
Option 4 ID : **6306802538700**

Q.3 A conductor of length 2 m moves at right angle to a magnetic field of flux density 3 Wb/m^2 with the velocity of 40 m/s. What will be the induced EMF?

Ans
✗ 1. 120 V
✗ 2. 60 V
✓ 3. 240 V
✗ 4. 480 V

Question ID : **630680648346**
Option 1 ID : **6306802538588**
Option 2 ID : **6306802538587**
Option 3 ID : **6306802538589**
Option 4 ID : **6306802538590**

Q.4 What is value of internal resistance of an ideal current source?

Ans
✗ 1. 1 Ω
✗ 2. 0 Ω
✓ 3. Infinity
✗ 4. 0.5 Ω

Question ID : **630680648463**
Option 1 ID : **6306802539056**
Option 2 ID : **6306802539055**
Option 3 ID : **6306802539057**
Option 4 ID : **6306802539058**

Q.5 If we want to erase a small line, which has many nearby lines, then which of the following instruments should be used?

Ans
✗ 1. T square
✓ 2. Erasing shield
✗ 3. Eraser
✗ 4. Mini drafter

Question ID : **630680648427**
Option 1 ID : **6306802538914**
Option 2 ID : **6306802538913**
Option 3 ID : **6306802538912**
Option 4 ID : **6306802538911**

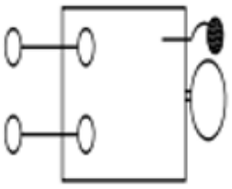
Q.6 Select the correct option regarding the given statements.

Statement 1: Location of the circuit and the type of wiring decide the size of cable.
Statement 2: The current carrying capacity of the cable decides the size of the cable.

Ans
✗ 1. Both statements are incorrect
✓ 2. Only statement 2 is correct
✗ 3. Only statement 1 is correct
✗ 4. Both statements are correct

Question ID : **630680648455**
Option 1 ID : **6306802539023**
Option 2 ID : **6306802539026**
Option 3 ID : **6306802539025**
Option 4 ID : **6306802539024**

Q.7



The above figure used in electrical circuits represents a/an:

Ans
✗ 1. electromagnet
✗ 2. buzzer
✓ 3. electric bell
✗ 4. relay

Question ID : **630680648378**
Option 1 ID : **6306802538717**
Option 2 ID : **6306802538715**
Option 3 ID : **6306802538716**
Option 4 ID : **6306802538718**

Q.8 The following symbol is used to represent which of the given options?

Ans
✗ 1. Bracket fan
✗ 2. Fan regulator
✓ 3. Ceiling fan
✗ 4. Exhaust fan

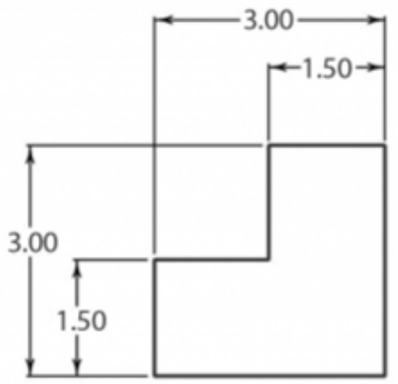
Question ID : **630680648451**
Option 1 ID : **6306802539009**
Option 2 ID : **6306802539010**
Option 3 ID : **6306802539007**
Option 4 ID : **6306802539008**

Q.9 **Which of following types of hydroelectric plants work like a giant battery?**

Ans
✓ 1. Pumped storage plants
✗ 2. Impoundment type plants
✗ 3. Diversion plants
✗ 4. Run of river plants

Question ID : **630680648458**
Option 1 ID : **6306802539036**
Option 2 ID : **6306802539037**
Option 3 ID : **6306802539038**
Option 4 ID : **6306802539035**

Q.10



The dimensioning system shown in the above figure is:

Ans
✔ 1. unidirectional system
✘ 2. aligned system
✘ 3. multidirectional system
✘ 4. non-aligned system

Question ID : **630680648353**
Option 1 ID : **6306802538617**
Option 2 ID : **6306802538615**
Option 3 ID : **6306802538618**
Option 4 ID : **6306802538616**

Q.11 **Which of the following statements is NOT correct?**

Ans
✘ 1. 8255 has three 8-bit unidirectional I/O ports.
✘ 2. 8255 is designed to interface the CPU with its outside world such as ADC, DAC, keyboard, etc.
✘ 3. 8255 consists of 40 pins.
✔ 4. 8255 is a general purpose programmable I/O device.

Question ID : **630680648450**
Option 1 ID : **6306802539005**
Option 2 ID : **6306802539004**
Option 3 ID : **6306802539006**
Option 4 ID : **6306802539003**

Q.12 Which of the following statements is true about the shaded-pole induction motor?

Ans
1. It is too costly.
2. The motor has high power factor.
3. The motor has high efficiency.
4. It is a single winding machine.

Question ID : **630680648401**
Option 1 ID : **6306802538810**
Option 2 ID : **6306802538809**
Option 3 ID : **6306802538808**
Option 4 ID : **6306802538807**

Q.13 The following symbol is used to represent which of the given options?

Ans
1. Projector
2. Flood light
3. Fluorescent lamp
4. Siren

Question ID : **630680648452**
Option 1 ID : **6306802539012**
Option 2 ID : **6306802539014**
Option 3 ID : **6306802539011**
Option 4 ID : **6306802539013**

Q.14 Which of the following statements pertaining to the bleeder resistor used in filter circuits are true?

A. It improves voltage regulation of the supply.

B. It provides safety to the technicians handling the equipment.

C. The value of bleeder resistance should be such that the bleeder resistor can conduct 20% of the total load current.

Ans
1. Only A and B are true
2. Only B and C are true
3. Only A and C are true
4. All the statements are true

Question ID : **630680648364**
Option 1 ID : **6306802538659**
Option 2 ID : **6306802538660**
Option 3 ID : **6306802538661**
Option 4 ID : **6306802538662**

Q.15 The total energy of an electron when it occupies L-shell of a hydrogen atom is:

Ans
✗ 1. 1.51 eV
✓ 2. −3.4 eV
✗ 3. −1.51 eV
✗ 4. 3.4 eV

Question ID : **630680648362**
Option 1 ID : **6306802538651**
Option 2 ID : **6306802538653**
Option 3 ID : **6306802538652**
Option 4 ID : **6306802538654**

Q.16 **Which of the following statements is NOT true?**

Ans
✗ 1. Run-of-river type plants do not require a dam to store river water in a reservoir.
✗ 2. Impoundment type plants are the most common type of hydroelectric plants.
✓ 3. Run-of-river type plants require a dam to store river water in a reservoir.
✗ 4. Impoundment type plants require a dam to store river water in a reservoir.

Question ID : **630680648459**
Option 1 ID : **6306802539042**
Option 2 ID : **6306802539039**
Option 3 ID : **6306802539041**
Option 4 ID : **6306802539040**

Q.17 **In which of the following devices can we control the turning on of the device but cannot control when it is turned off?**
I – SCR, II – TRIAC, III – DIAC, IV – Diode

Ans
✓ 1. I, II
✗ 2. I, IV
✗ 3. II, III
✗ 4. III, IV

Question ID : **630680648496**
Option 1 ID : **6306802539187**
Option 2 ID : **6306802539190**
Option 3 ID : **6306802539188**
Option 4 ID : **6306802539189**

Q.18 The number of magnetic lines of force emanating from a magnetic material is known as:

Ans
✗ 1. magnetic intensity
✗ 2. magnetic field
✓ 3. flux
✗ 4. flux density

Question ID : **630680648344**
Option 1 ID : **6306802538582**
Option 2 ID : **6306802538581**
Option 3 ID : **6306802538579**
Option 4 ID : **6306802538580**

Q.19 Coil A and Coil B have self-inductance of 125 μH and 500 μH, respectively. A current of 2 A in Coil A produces flux linkages of 200 μWb turns in Coil B. Calculate the coefficient of coupling.

Ans
✗ 1. 0.45
✗ 2. 0.3
✗ 3. 0.25
✓ 4. 0.4

Question ID : **630680648347**
Option 1 ID : **6306802538594**
Option 2 ID : **6306802538592**
Option 3 ID : **6306802538591**
Option 4 ID : **6306802538593**

Q.20 **Which of the following is/are considered to be an intermittent energy source?**

Ans
✗ 1. Thermal power from coal
✗ 2. Hydroelectric power
✗ 3. Diesel generator
✓ 4. Solar power plants

Question ID : **630680648456**
Option 1 ID : **6306802539027**
Option 2 ID : **6306802539029**
Option 3 ID : **6306802539028**
Option 4 ID : **6306802539030**

Section : **Section A4**

Q.1 **Which of the following statements is true regarding inverters?**

Ans
✓ 1. It converts DC into AC.
✗ 2. It converts AC into DC.
✗ 3. It changes the frequency of AC.
✗ 4. It changes AC into AC with different voltage.

Question ID : **630680648479**
Option 1 ID : **6306802539121**
Option 2 ID : **6306802539119**
Option 3 ID : **6306802539120**
Option 4 ID : **6306802539122**

Q.2 Transistor-transistor logic is a logic family implemented with the bipolar process technology that integrates:

Ans
✗ 1. PNP transistors, PN junction diodes and diffused resistors

✓ 2. NPN transistors, PN junction diodes and diffused resistors

✗ 3. PNP transistors, PN junction diodes and diffused capacitors

✗ 4. NPN transistors, PN junction diodes and diffused capacitors

Question ID : **630680648369**
Option 1 ID : **6306802538679**
Option 2 ID : **6306802538681**
Option 3 ID : **6306802538680**
Option 4 ID : **6306802538682**

Q.3 **What is residual flux density?**

Ans
✗ 1. It is the value of required magnetic field to make flux density zero.

✓ 2. It is the remaining value of flux density after removal of magnetic field.

✗ 3. It is the maximum value of flux density in magnetisation curve.

✗ 4. It is the minimum value of flux density in magnetisation curve.

Question ID : **630680648436**
Option 1 ID : **6306802538947**
Option 2 ID : **6306802538948**
Option 3 ID : **6306802538949**
Option 4 ID : **6306802538950**

Q.4 **What will be the value of current, if N number of electrons are passing through a wire in T time?**

Ans
✗ 1. N*T

✗ 2. eT/N (e = Charge on one electron)

✓ 3. eN/T (e = Charge on one electron)

✗ 4. N/T

Question ID : **630680648421**
Option 1 ID : **6306802538888**
Option 2 ID : **6306802538890**
Option 3 ID : **6306802538889**
Option 4 ID : **6306802538887**

Q.5 **Measurement of a quantity having its true value equal to 10 is done with two instruments. First instrument shows the value to be 8.01, 8.02, 8.01 in three measurements and second instrument shows the value to be 10, 10.1, 10.2 in three measurements. Which of the following statements is true?**

Ans
✗ 1. The first instrument is less accurate and less precise than the second instrument.

✓ 2. The first instrument is less accurate but more precise than the second instrument.

✗ 3. The first instrument is more accurate but less precise than the second instrument.

✗ 4. The first instrument is both more accurate and more precise than the second instrument.

Question ID : **630680648481**
Option 1 ID : **6306802539130**
Option 2 ID : **6306802539128**
Option 3 ID : **6306802539127**
Option 4 ID : **6306802539129**

Q.6 **The standard heights of letters recommended by BIS SP: 46-2003 are in the progressive ratio of:**

Ans
✓ 1. square root of 2

✗ 2. square root of 3

✗ 3. square of 3

✗ 4. square of 2

Question ID : **630680648430**
Option 1 ID : **6306802538925**
Option 2 ID : **6306802538924**
Option 3 ID : **6306802538926**
Option 4 ID : **6306802538923**

Q.7 **The area of magnetisation curve for hard magnetic materials will be:**

Ans
✗ 1. larger or smaller than soft magnetic materials depending on the material

✓ 2. larger than soft magnetic materials

✗ 3. same as soft magnetic materials

✗ 4. smaller than soft magnetic materials

Question ID : **630680648437**
Option 1 ID : **6306802538954**
Option 2 ID : **6306802538951**
Option 3 ID : **6306802538953**
Option 4 ID : **6306802538952**

Q.8 Which of the following magnetic quantities is represented in ampere-turns per weber?

Ans
1. Susceptance
2. Reluctance
3. Magnetomotive force
4. Magnetic flux density

Question ID : **630680648345**
Option 1 ID : **6306802538586**
Option 2 ID : **6306802538585**
Option 3 ID : **6306802538584**
Option 4 ID : **6306802538583**

Q.9 In Category B type, the height of the uppercase letter is divided into _____ parts.

Ans
1. 6
2. 8
3. 10
4. 14

Question ID : **630680648351**
Option 1 ID : **6306802538607**
Option 2 ID : **6306802538608**
Option 3 ID : **6306802538609**
Option 4 ID : **6306802538610**

Q.10 The load factor for an electrical power supply system is defined as:

Ans
1. $\frac{\text{Connected load}}{\text{Average load}}$
2. $\frac{\text{Connected load}}{\text{Maximum demand}}$
3. $\frac{\text{Average load}}{\text{Connected load}}$
4. $\frac{\text{Average load}}{\text{Maximum demand}}$

Question ID : **630680648385**
Option 1 ID : **6306802538745**
Option 2 ID : **6306802538746**
Option 3 ID : **6306802538743**
Option 4 ID : **6306802538744**

Q.11 **Which of the following is an INCORRECT statement?**

Ans ✗ 1. In a star connected network, line voltage magnitude will be more than phase voltage magnitude.

✓ 2. In a delta connected network, line current magnitude will be less than phase current magnitude.

✗ 3. In a star connected network, line voltage will lead its corresponding phase voltage.

✗ 4. In a delta connected network, line voltage will be same as its corresponding phase voltage.

Question ID : **630680648499**
Option 1 ID : **6306802539201**
Option 2 ID : **6306802539202**
Option 3 ID : **6306802539199**
Option 4 ID : **6306802539200**

Q.12 Which of the following instruments is used to measure the humidity?

Ans ✗ 1. Salinometer

✗ 2. Barometer

✗ 3. Gravimeter

✓ 4. Hygrometer

Question ID : **630680648412**
Option 1 ID : **6306802538854**
Option 2 ID : **6306802538851**
Option 3 ID : **6306802538852**
Option 4 ID : **6306802538853**

Q.13 **What is the effect of armature reaction in a three-phase synchronous generator, in case of zero power factor leading load?**

Ans ✓ 1. Magnetising

✗ 2. Cross magnetising

✗ 3. Demagnetising

✗ 4. Both demagnetising and cross magnetising

Question ID : **630680648504**
Option 1 ID : **6306802539219**
Option 2 ID : **6306802539221**
Option 3 ID : **6306802539220**
Option 4 ID : **6306802539222**

Q.14 There is a voltage source V_1 in series with its internal resistance R_s and load resistance is R_L, which is variable. Which of the following conditions does NOT indicate maximum power transfer to the load?

Ans

✗ 1. When $R_s = R_L$.

✓ 2. When power transfer efficiency is 100%.

✗ 3. When power transfer efficiency is 50%.

✗ 4. When voltage across load is $V_1/2$.

Question ID : **630680648467**
Option 1 ID : **6306802539072**
Option 2 ID : **6306802539073**
Option 3 ID : **6306802539074**
Option 4 ID : **6306802539071**

Q.15 **In a magnetic circuit, if air gap is introduced, then in order to establish same flux, which of the following statements is correct?**

Ans

✗ 1. MMF should be reduced.

✗ 2. MMF must remain same.

✓ 3. MMF should be increased.

✗ 4. Flux can never be same irrespective of MMF.

Question ID : **630680648425**
Option 1 ID : **6306802538903**
Option 2 ID : **6306802538905**
Option 3 ID : **6306802538904**
Option 4 ID : **6306802538906**

Q.16 **Which of the following is the world's first microprocessor?**

Ans

✓ 1. 4004

✗ 2. 8085

✗ 3. 1004

✗ 4. 8004

Question ID : **630680648448**
Option 1 ID : **6306802538995**
Option 2 ID : **6306802538997**
Option 3 ID : **6306802538998**
Option 4 ID : **6306802538996**

Q.17 **What will be the resistance offered by a lamp of 1 kW rated for 200 V?**

Ans

✓ 1. 40 Ω

✗ 2. Cannot be determined

✗ 3. 10 Ω

✗ 4. 5 Ω

Question ID : **630680648493**
Option 1 ID : **6306802539177**
Option 2 ID : **6306802539178**
Option 3 ID : **6306802539175**
Option 4 ID : **6306802539176**

Q.18 Which of the following devices is used to step-up or step-down DC voltage?

Ans
✗ 1. Transformer
✓ 2. Chopper
✗ 3. Rectifier
✗ 4. Inverter

Question ID : **630680648507**
Option 1 ID : **6306802539231**
Option 2 ID : **6306802539232**
Option 3 ID : **6306802539233**
Option 4 ID : **6306802539234**

Q.19 Which of the following is NOT a systematic error?

Ans
✗ 1. Instrument error
✓ 2. Gross error
✗ 3. Observational error
✗ 4. Environmental error

Question ID : **630680648482**
Option 1 ID : **6306802539132**
Option 2 ID : **6306802539131**
Option 3 ID : **6306802539134**
Option 4 ID : **6306802539133**

Q.20 The area under the load curve represents the:

Ans
✗ 1. total cost of power generation
✗ 2. maximum demand of the power station
✓ 3. total energy generated during the period
✗ 4. average load on the power station

Question ID : **630680648386**
Option 1 ID : **6306802538749**
Option 2 ID : **6306802538748**
Option 3 ID : **6306802538750**
Option 4 ID : **6306802538747**

Section : **Section A5**

Q.1 Which of the following is a semi-controlled device?

Ans
✗ 1. DIAC
✗ 2. Diode
✓ 3. SCR
✗ 4. GTO

Question ID : **630680648476**
Option 1 ID : **6306802539109**
Option 2 ID : **6306802539108**
Option 3 ID : **6306802539107**
Option 4 ID : **6306802539110**

Q.2 What will be the rotor speed if slip is zero, in case of a three-phase induction motor?

Ans
✗ 1. Half of synchronous speed
✗ 2. Zero
✓ 3. Equal to synchronous speed
✗ 4. Double of synchronous speed

Question ID : **630680648505**
Option 1 ID : **6306802539225**
Option 2 ID : **6306802539224**
Option 3 ID : **6306802539223**
Option 4 ID : **6306802539226**

Q.3 The output characteristic of BJT in CE configuration is a graph between which of the following quantities?

Ans
✓ 1. I_C vs V_{CE}
✗ 2. I_B vs V_{CE}
✗ 3. I_C vs V_{BE}
✗ 4. I_B vs V_{BE}

Question ID : **630680648442**
Option 1 ID : **6306802538973**
Option 2 ID : **6306802538971**
Option 3 ID : **6306802538972**
Option 4 ID : **6306802538974**

Q.4 What is the value of AD-BC, for nominal pi circuit of medium transmission line (where A, B, C and D are transmission line parameters)?

Ans
✓ 1. 1
✗ 2. 0
✗ 3. 1/YZ
✗ 4. YZ

Question ID : **630680648492**
Option 1 ID : **6306802539173**
Option 2 ID : **6306802539171**
Option 3 ID : **6306802539174**
Option 4 ID : **6306802539172**

Q.5 **A device used for converting AC into DC is known as:**

Ans
✔ 1. rectifier
✘ 2. inverter
✘ 3. cycloconverter
✘ 4. chopper

Question ID : **630680648506**
Option 1 ID : **6306802539227**
Option 2 ID : **6306802539228**
Option 3 ID : **6306802539229**
Option 4 ID : **6306802539230**

Q.6 The thermoelectric effect caused by contact potentials at hot and cold junctions is known as the:

Ans
✔ 1. Seebeck effect
✘ 2. Peltier effect
✘ 3. Thomson effect
✘ 4. Hall effect

Question ID : **630680648411**
Option 1 ID : **6306802538849**
Option 2 ID : **6306802538848**
Option 3 ID : **6306802538850**
Option 4 ID : **6306802538847**

Q.7 If the Thévenin's voltage and Thévenin's resistance of a circuit are given as V_{TH} and R_{TH}, respectively, then the maximum power that can be transferred to the circuit is:

Ans
✔ 1. $\frac{V^2_{TH}}{4R_{TH}}$
✘ 2. $\frac{V^2_{TH}}{2R_{TH}}$
✘ 3. $\frac{V^2_{TH}}{R_{TH}}$
✘ 4. $\frac{2V^2_{TH}}{R_{TH}}$

Question ID : **630680648392**
Option 1 ID : **6306802538773**
Option 2 ID : **6306802538772**
Option 3 ID : **6306802538771**
Option 4 ID : **6306802538774**

Q.8 **When will DC transmission become more economical than AC transmission?**

Ans
✗ 1. When transmission distance is less than 50 km for overhead lines.
✗ 2. When transmission distance is less than 600 km for overhead lines.
✓ 3. When transmission distance is more than 600 km for overhead lines.
✗ 4. When transmission distance is more than 100 km for overhead lines.

Question ID : **630680648486**
Option 1 ID : **6306802539147**
Option 2 ID : **6306802539150**
Option 3 ID : **6306802539149**
Option 4 ID : **6306802539148**

Q.9 **If we require rapid increase in power generated, then which of the following is most suitable?**

Ans
✓ 1. Hydro power plant
✗ 2. Nuclear power plant
✗ 3. Solar power plant
✗ 4. Thermal power plant

Question ID : **630680648509**
Option 1 ID : **6306802539239**
Option 2 ID : **6306802539241**
Option 3 ID : **6306802539242**
Option 4 ID : **6306802539240**

Q.10

The diode shown in the above figure is a:

Ans
✗ 1. Gunn diode
✓ 2. light-emitting diode
✗ 3. varactor diode
✗ 4. photodiode

Question ID : **630680648377**
Option 1 ID : **6306802538712**
Option 2 ID : **6306802538711**
Option 3 ID : **6306802538714**
Option 4 ID : **6306802538713**

Q.11 Which of the following statements is true regarding nuclear power plants?

Ans

✗ 1. Nuclear power plants are peak load plants.

✗ 2. They have low initial cost.

✓ 3. Nuclear power plants are base load plants.

✗ 4. They have high fuel cost of operation.

Question ID : **630680648460**
Option 1 ID : **6306802539044**
Option 2 ID : **6306802539045**
Option 3 ID : **6306802539043**
Option 4 ID : **6306802539046**

Q.12 Which of the following equations is correct for the concentration of electrons and holes in the valence band of a semiconductor with impurities, where n_e and n_h are the concentrations of electrons and holes, respectively, and n_i is the concentration of either electrons or holes when no impurities are added?

Ans

✓ 1. $n_e\, n_h = n_i^2$

✗ 2. $n_e\, n_h = \sqrt{n_i}$

✗ 3. $n_e\, n_h = n_i$

✗ 4. $n_e\, n_h = 2n_i$

Question ID : **630680648357**
Option 1 ID : **6306802538634**
Option 2 ID : **6306802538633**
Option 3 ID : **6306802538631**
Option 4 ID : **6306802538632**

Q.13 Which of the following statements is correct during no load operation of a transformer?

Ans

✗ 1. Power consumed is zero.

✓ 2. Power consumed is due to iron losses only.

✗ 3. Power factor is very high.

✗ 4. Power consumed is due to copper losses as well as iron losses.

Question ID : **630680648471**
Option 1 ID : **6306802539089**
Option 2 ID : **6306802539090**
Option 3 ID : **6306802539088**
Option 4 ID : **6306802539087**

Q.14 Which of the following statements is FALSE about shell type transformers?

Ans
✗ 1. The magnetic circuit is divided into two or more parts.
✓ 2. The coils used are of cylindrical type.
✗ 3. Shell type transformers are preferred for low capacity.
✗ 4. Both HV and LV windings are placed on the central limb.

Question ID : **630680648397**
Option 1 ID : **6306802538791**
Option 2 ID : **6306802538793**
Option 3 ID : **6306802538794**
Option 4 ID : **6306802538792**

Q.15 In cold conditions, a diesel engine is started by delivering:

Ans
✗ 1. gasoline
✗ 2. burning fuel
✓ 3. hot air
✗ 4. the ignition

Question ID : **630680648383**
Option 1 ID : **6306802538737**
Option 2 ID : **6306802538736**
Option 3 ID : **6306802538735**
Option 4 ID : **6306802538738**

Q.16 What is value of $(17)_8$ into decimal system?

Ans
✗ 1. 14
✗ 2. 13
✓ 3. 15
✗ 4. 12

Question ID : **630680648443**
Option 1 ID : **6306802538976**
Option 2 ID : **6306802538977**
Option 3 ID : **6306802538975**
Option 4 ID : **6306802538978**

Q.17 Define 'D' in the 'ABCD' parameters for a transmission line.

Ans
✔ 1.
It is the current (in amperes) into the sending end per ampere on the short-circuited receiving end.

✘ 2.
It is the voltage impressed at the sending end per voltage at the receiving end when the receiving end is open.

✘ 3.
It is the current (in amperes) into the sending end per voltage on the open-circuited receiving end.

✘ 4.
It is the transfer impedance of the transmission line when the receiving terminals are short circuited.

Question ID : **630680648418**
Option 1 ID : **6306802538876**
Option 2 ID : **6306802538875**
Option 3 ID : **6306802538877**
Option 4 ID : **6306802538878**

Q.18 Which of following link configurations in the DC transmission system has a single conductor of negative polarity and uses the earth or the sea for the return path of current?

Ans
✘ 1. Bipolar link

✔ 2. Monopolar link

✘ 3. Unipolar link

✘ 4. Homopolar link

Question ID : **630680648414**
Option 1 ID : **6306802538859**
Option 2 ID : **6306802538861**
Option 3 ID : **6306802538862**
Option 4 ID : **6306802538860**

Q.19 What is the equation for determining sag in a transmission line, where 'L' is the span length, 'W' is the weight per unit length of the conductor and 'H' is the tension in the conductor at the point of maximum deflection?

Ans
✔ 1. $\frac{WL^2}{8H}$

✘ 2. $\frac{WL}{4H}$

✘ 3. $\frac{WL^2}{4H}$

✘ 4. $\frac{WL}{8H}$

Question ID : **630680648416**
Option 1 ID : **6306802538870**
Option 2 ID : **6306802538867**
Option 3 ID : **6306802538868**
Option 4 ID : **6306802538869**

Q.20 The representative fraction for a reducing scale is always:

Ans
1. 1
2. > 2
3. < 1
4. > 1

Question ID : **630680648354**
Option 1 ID : **6306802538619**
Option 2 ID : **6306802538622**
Option 3 ID : **6306802538620**
Option 4 ID : **6306802538621**

Section : **Section B1**

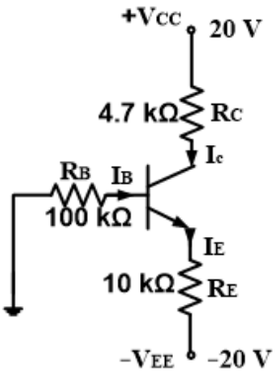
Q.1 What is the simplified form of the given Boolean expression?

$(A + B)(\bar{A} + B)$

Ans
1. A
2. B
3. A + B
4. AB

Question ID : **630680648295**
Option 1 ID : **6306802538383**
Option 2 ID : **6306802538384**
Option 3 ID : **6306802538386**
Option 4 ID : **6306802538385**

Q.2 For the emitter bias circuit shown, what is I_E if $V_{BE} = 0.7$ V and $\beta = 100$?



Ans
1. 17.5 mA
2. 0.075 mA
3. 1.75 mA
4. 0.75 mA

Question ID : **630680648292**
Option 1 ID : **6306802538373**
Option 2 ID : **6306802538374**
Option 3 ID : **6306802538371**
Option 4 ID : **6306802538372**

Q.3 What is the back EMF of a 200 V DC motor, while drawing an armature current of 100 A, if the armature resistance is 0.1 Ω?

Ans
1. 200 V
2. 210 V
3. 205 V
4. 190 V

Question ID : **630680648314**
Option 1 ID : **6306802538459**
Option 2 ID : **6306802538461**
Option 3 ID : **6306802538462**
Option 4 ID : **6306802538460**

Q.4 In a 3-wire DC distributor, the area of cross-section of the outer conductors is 10 mm^2. What is the area of cross-section of the neutral conductor?

Ans

✔ 1. $5\ mm^2$

✗ 2. $10\ mm^2$

✗ 3. $\frac{10}{3}\ mm^2$

✗ 4. $20\ mm^2$

Question ID : **630680648277**
Option 1 ID : **6306802538314**
Option 2 ID : **6306802538311**
Option 3 ID : **6306802538313**
Option 4 ID : **6306802538312**

Q.5 A 200 V DC shunt motor, with armature resistances of 1 Ω, takes an armature current of 50 A at rated torque and runs at 1000 rpm. What resistance must be put in series with the armature to obtain rated torque at starting?

Ans

✗ 1. 4 Ω

✗ 2. 1 Ω

✔ 3. 3 Ω

✗ 4. 2 Ω

Question ID : **630680648335**
Option 1 ID : **6306802538543**
Option 2 ID : **6306802538546**
Option 3 ID : **6306802538544**
Option 4 ID : **6306802538545**

Q.6 A 132-kV transmission line has a sag of 10 m between two level supports when the length of span is 200 m. If the span is increased to 400 m, then what will be the sag?

Ans

✗ 1. 30 m

✔ 2. 40 m

✗ 3. 20 m

✗ 4. 10 m

Question ID : **630680648275**
Option 1 ID : **6306802538306**
Option 2 ID : **6306802538304**
Option 3 ID : **6306802538305**
Option 4 ID : **6306802538303**

Q.7 The magneto motive force produced in a current carrying coil of 100 turns is 1000 AT. What is the current flowing through the coil?

Ans
1. ✗ 100 A
2. ✓ 10 A
3. ✗ 1 A
4. ✗ 0.5 A

Question ID : **630680648231**
Option 1 ID : **6306802538129**
Option 2 ID : **6306802538130**
Option 3 ID : **6306802538127**
Option 4 ID : **6306802538128**

Q.8 What is the input resistance of the transistor if a change of 100 mV in the base-emitter voltage causes a change of 50 μA in the base current?

Ans
1. ✗ 20 kΩ
2. ✓ 2 kΩ
3. ✗ 20 Ω
4. ✗ 200 Ω

Question ID : **630680648243**
Option 1 ID : **6306802538178**
Option 2 ID : **6306802538175**
Option 3 ID : **6306802538177**
Option 4 ID : **6306802538176**

Q.9 A NPN transistor has a current amplification factor of 0.98. What is its emitter current and base current amplification factor when the base current is 10 μA?

Ans
1. ✗ 5 mA and 49
2. ✗ 5 mA and 51
3. ✗ 0.5 mA and 51
4. ✓ 0.5 mA and 49

Question ID : **630680648330**
Option 1 ID : **6306802538524**
Option 2 ID : **6306802538525**
Option 3 ID : **6306802538526**
Option 4 ID : **6306802538523**

Q.10 An analogue voltmeter has a linear scale of 500 divisions. Its full-scale reading is 100 V. What is the resolution of the meter, if one-fourth of a division can be read accurately?

Ans

✗ 1. 0.025

✗ 2. 0.01

✗ 3. 0.075

✓ 4. 0.05

Question ID : **630680648329**
Option 1 ID : **6306802538519**
Option 2 ID : **6306802538522**
Option 3 ID : **6306802538521**
Option 4 ID : **6306802538520**

Q.11 The ratio of the number of turns in the HV winding to the number of turns in the LV winding of a single-phase transformer is 10. What is the equivalent resistance of the transformer referred to the HV side if the resistance of the HV and LV windings are 1.5 Ω and 0.05 Ω, respectively?

Ans

✗ 1. 1.55 Ω

✗ 2. 5.6 Ω

✓ 3. 6.5 Ω

✗ 4. 2 Ω

Question ID : **630680648263**
Option 1 ID : **6306802538258**
Option 2 ID : **6306802538256**
Option 3 ID : **6306802538257**
Option 4 ID : **6306802538255**

Q.12 In a three-wire DC distribution system, what will be the current in the neutral wire if the load on the positive side is 500 A and on the negative side is 300 A?

Ans

✓ 1. 200 A

✗ 2. 400 A

✗ 3. 100 A

✗ 4. 800 A

Question ID : **630680648326**
Option 1 ID : **6306802538508**
Option 2 ID : **6306802538507**
Option 3 ID : **6306802538509**
Option 4 ID : **6306802538510**

Q.13 What is the execution time of an instruction that requires a machine cycle of four T-states with a clock frequency of 2 MHz?

Ans

✗ 1. 4 μs

✗ 2. 0.5 μs

✓ 3. 2 μs

✗ 4. 1 μs

Question ID : **630680648247**
Option 1 ID : **6306802538193**
Option 2 ID : **6306802538191**
Option 3 ID : **6306802538192**
Option 4 ID : **6306802538194**

Q.14 A piezo-electric type accelerometer has a sensitivity of 100 mV/g. The transducer is subjected to a constant acceleration of 5 g. What will be the steady state output of the transducer?

Ans

✗ 1. 5 V

✗ 2. 100 mV

✗ 3. 0.5 V

✓ 4. 0 V

Question ID : **630680648334**
Option 1 ID : **6306802538542**
Option 2 ID : **6306802538540**
Option 3 ID : **6306802538541**
Option 4 ID : **6306802538539**

Q.15 An AC voltage of $v = 20\sin 314t$ is connected in series with a silicon diode and a load resistance of 98 Ω. The forward resistance of the diode is 2 Ω. What is the peak current through the diode?

Ans

✓ 1. 193 mA

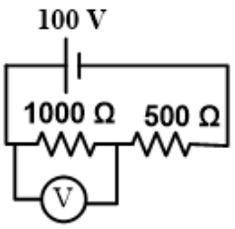
✗ 2. 1.93 A

✗ 3. 1.93 mA

✗ 4. 19.3 mA

Question ID : **630680648290**
Option 1 ID : **6306802538365**
Option 2 ID : **6306802538366**
Option 3 ID : **6306802538363**
Option 4 ID : **6306802538364**

Q.16 In the circuit shown here, what will be the voltmeter reading if the resistance of the voltmeter is 1000 Ω?



Ans
1. 20 V
2. 50 V
3. 75 V
4. 25 V

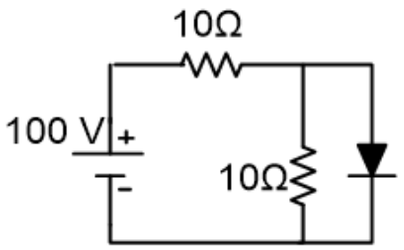
Question ID : **630680648278**
Option 1 ID : **6306802538318**
Option 2 ID : **6306802538316**
Option 3 ID : **6306802538317**
Option 4 ID : **6306802538315**

Q.17 In a two-wire DC transmission system with one conductor earthed, if the length of the line is doubled, then, the line loss _____ for the same power and transmission voltage.

Ans
1. remains same
2. becomes twice
3. becomes three times
4. becomes four times

Question ID : **630680648325**
Option 1 ID : **6306802538504**
Option 2 ID : **6306802538505**
Option 3 ID : **6306802538503**
Option 4 ID : **6306802538506**

Q.18 What is the current running through the diode in the circuit shown here, assuming the diode to be ideal?



Ans
1. 0 A
2. 5 A
3. 10 A
4. 20 A

Question ID : **630680648291**
Option 1 ID : **6306802538370**
Option 2 ID : **6306802538367**
Option 3 ID : **6306802538368**
Option 4 ID : **6306802538369**

Q.19 A 16-kW, single-phase load at power factor of 0.8 lagging is supplied from a single-phase AC supply. How much reactive power will be drawn from the supply?

Ans
1. 16 kVAr leading
2. 12 kVAr leading
3. 12 kVAr lagging
4. 16 kVAr lagging

Question ID : **630680648331**
Option 1 ID : **6306802538529**
Option 2 ID : **6306802538528**
Option 3 ID : **6306802538527**
Option 4 ID : **6306802538530**

Q.20 A capacitor of 1 μF is connected in series with a 1 MΩ resistance and is required to be charged to 80% of the final value. Which relation is correct for the time taken for charging?

Ans
1. $e^{-t} = 0.8$
2. $e^{-t} = 1.8$
3. $e^{-t} = 1$
4. $e^{-t} = 0.2$

Question ID : **630680648281**
Option 1 ID : **6306802538329**
Option 2 ID : **6306802538328**
Option 3 ID : **6306802538330**
Option 4 ID : **6306802538327**

Section : **Section B2**

Q.1 In a map, a 36-km distance is shown by a 45-cm-long line. What is the representative fraction?

Ans

✗ 1. $\frac{1}{8 \times 10^2}$

✗ 2. $\frac{1}{8 \times 10^6}$

✓ 3. $\frac{1}{8 \times 10^4}$

✗ 4. $\frac{1}{8 \times 10^3}$

Question ID : **630680648234**
Option 1 ID : **6306802538140**
Option 2 ID : **6306802538142**
Option 3 ID : **6306802538139**
Option 4 ID : **6306802538141**

Q.2 When tested for insulation resistance between the conductors and earth or between the phase and the neutral in a domestic wiring installation, insulation resistance measured must be _____.

Ans

✗ 1. 1 kΩ or more

✗ 2. 100 Ω or more

✓ 3. 1 MΩ or more

✗ 4. 5000 Ω or more

Question ID : **630680648302**
Option 1 ID : **6306802538411**
Option 2 ID : **6306802538413**
Option 3 ID : **6306802538412**
Option 4 ID : **6306802538414**

Q.3 What is the length of the scale that is needed to measure 20 cm with a representative factor of 2.5?

Ans

✗ 1. 4 cm

✓ 2. 8 cm

✗ 3. 6 cm

✗ 4. 12.5 cm

Question ID : **630680648284**
Option 1 ID : **6306802538339**
Option 2 ID : **6306802538342**
Option 3 ID : **6306802538341**
Option 4 ID : **6306802538340**

Q.4 The no load speed of a DC shunt motor is 1000 rpm with rated voltage applied across the motor. What will be its speed on no load if the voltage across the motor is reduced to 50% of rated voltage?

Ans

✗ 1. 2000 rpm

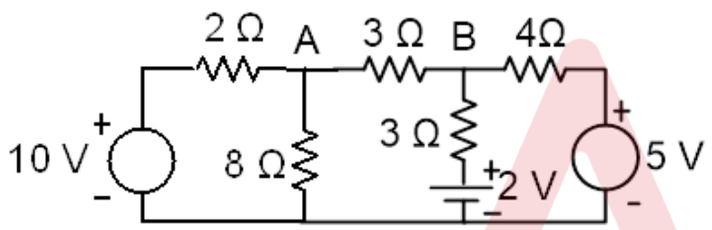
✗ 2. 500 rpm

✓ 3. 1000 rpm

✗ 4. 200 rpm

Question ID : **630680648311**
Option 1 ID : **6306802538449**
Option 2 ID : **6306802538448**
Option 3 ID : **6306802538447**
Option 4 ID : **6306802538450**

Q.5 Which of the following is the correct nodal equation at B?



Ans

✗ 1. $\frac{V_B - 2}{3} + \frac{V_B - 5}{4} + \frac{V_B - V_A}{13} = 0$

✓ 2. $\frac{V_B - 2}{3} + \frac{V_B - 5}{4} + \frac{V_B - V_A}{3} = 0$

✗ 3. $\frac{V_B + 2}{3} + \frac{V_B + 5}{4} + \frac{V_B - V_A}{3} = 0$

✗ 4. $\frac{V_B - 2}{3} + \frac{V_B - 5}{4} + \frac{V_B + V_A}{13} = 0$

Question ID : **630680648259**
Option 1 ID : **6306802538239**
Option 2 ID : **6306802538241**
Option 3 ID : **6306802538240**
Option 4 ID : **6306802538242**

Q.6 Arrowheads that are used to indicate the dimension line must include a minimum angle of _____.

Ans
✔ 1. 15°
✘ 2. 30°
✘ 3. 45°
✘ 4. 10°

Question ID : **630680648282**
Option 1 ID : **6306802538332**
Option 2 ID : **6306802538333**
Option 3 ID : **6306802538334**
Option 4 ID : **6306802538331**

Q.7 A series motor develops a torque of 20 Nm while taking a line current of 20 A from a 200-V supply. If it operates in the linear magnetisation region, then what will be the torque developed when the line current drawn is 40 A?

Ans
✘ 1. 20 Nm
✘ 2. 40 Nm
✘ 3. 160 Nm
✔ 4. 80 Nm

Question ID : **630680648265**
Option 1 ID : **6306802538264**
Option 2 ID : **6306802538263**
Option 3 ID : **6306802538265**
Option 4 ID : **6306802538266**

Q.8 A domestic wiring installation has 100 number of points in the circuit. What should be the standard value of insulation resistance as per BIS?

Ans
✔ 1. 0.5 MΩ
✘ 2. 50 MΩ
✘ 3. 0.05 MΩ
✘ 4. 5 MΩ

Question ID : **630680648253**
Option 1 ID : **6306802538217**
Option 2 ID : **6306802538215**
Option 3 ID : **6306802538216**
Option 4 ID : **6306802538218**

Q.9 Which line is drawn perpendicular to the surface that is to be dimensioned?

Ans
✘ 1. Dimension line
✘ 2. Construction line
✘ 3. Pointer line
✔ 4. Projection line

Question ID : **630680648283**
Option 1 ID : **6306802538336**
Option 2 ID : **6306802538337**
Option 3 ID : **6306802538338**
Option 4 ID : **6306802538335**

Q.10 A voltmeter records 200 V, 202 V, 204 V and 206 V in an experiment. What is the arithmetic mean of the readings?

Ans

✗ 1. 202 V

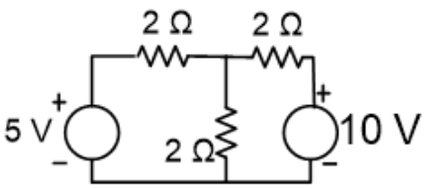
✗ 2. 204 V

✗ 3. 201 V

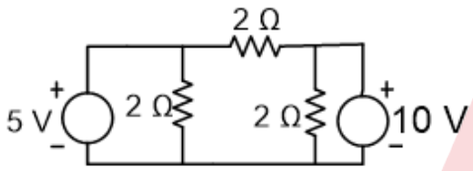
✓ 4. 203 V

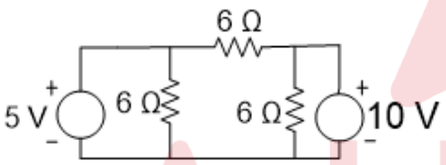
Question ID : **630680648270**
Option 1 ID : **6306802538285**
Option 2 ID : **6306802538284**
Option 3 ID : **6306802538283**
Option 4 ID : **6306802538286**

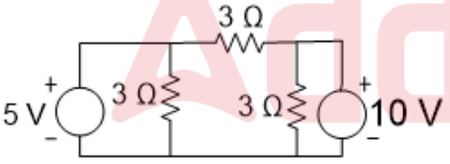
Q.11 The circuit shown here is equivalent to _____.

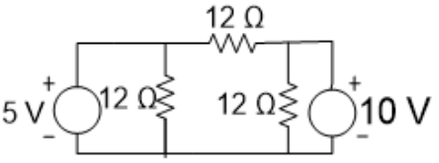


Ans

✗ 1.


✓ 2.


✗ 3.


✗ 4.


Question ID : **630680648310**
Option 1 ID : **6306802538443**
Option 2 ID : **6306802538445**
Option 3 ID : **6306802538444**
Option 4 ID : **6306802538446**

Q.12 What is the maximum output voltage for a 100 °C temperature difference at room temperature using one junction of dissimilar metals having thermos-electric sensitivities 50 μV/ °C and 550 μV/ °C ?

Ans

✗ 1. 500 mV

✓ 2. 50 mV

✗ 3. 0.5 mV

✗ 4. 5 mV

Question ID : **630680648323**
Option 1 ID : **6306802538497**
Option 2 ID : **6306802538496**
Option 3 ID : **6306802538498**
Option 4 ID : **6306802538495**

Q.13 The maximum demand of a consumer is 400 kW at 50% load factor. The tariff charged is ₹100 per kW of the maximum demand and ₹2 per unit consumed. What is the overall cost per unit if the total energy consumption is 40000 kWh?

Ans

✗ 1. ₹2.5

✓ 2. ₹25

✗ 3. ₹5

✗ 4. ₹50

Question ID : **630680648257**
Option 1 ID : **6306802538231**
Option 2 ID : **6306802538232**
Option 3 ID : **6306802538234**
Option 4 ID : **6306802538233**

Q.14 A 0-20 A ammeter has a guaranteed accuracy of 2% of full-scale reading. The current measured by this instrument is 5 A. What is the relative error at this current?

Ans

✗ 1. 0.04

✓ 2. 0.08

✗ 3. 0.1

✗ 4. 0.02

Question ID : **630680648320**
Option 1 ID : **6306802538483**
Option 2 ID : **6306802538484**
Option 3 ID : **6306802538485**
Option 4 ID : **6306802538486**

Q.15 A resistance wire strain gauge using a soft iron wire of small diameter has a gauge factor of + 4. Neglecting piezoresistive effects, what is the Poisson's ratio?

Ans
1. ✔ 1.5
2. ✘ 4
3. ✘ 3
4. ✘ 2

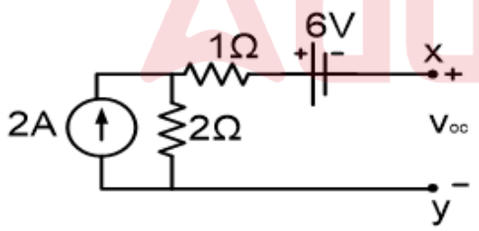
Question ID : **630680648322**
Option 1 ID : **6306802538492**
Option 2 ID : **6306802538494**
Option 3 ID : **6306802538493**
Option 4 ID : **6306802538491**

Q.16 Average energy available to be extracted from a catchment area by a hydro-plant per annum is 8760×10^8 kWh. What should be the maximum capacity of the generators if the load factor is 0.5?

Ans
1. ✘ 100 MW
2. ✔ 200 MW
3. ✘ 300 MW
4. ✘ 400 MW

Question ID : **630680648255**
Option 1 ID : **6306802538223**
Option 2 ID : **6306802538226**
Option 3 ID : **6306802538225**
Option 4 ID : **6306802538224**

Q.17 What is the open circuit voltage V_{oc} at the terminals X Y in the circuit shown here?



Ans
1. ✘ −10 V
2. ✔ −2 V
3. ✘ 6 V
4. ✘ −1 V

Question ID : **630680648309**
Option 1 ID : **6306802538442**
Option 2 ID : **6306802538441**
Option 3 ID : **6306802538440**
Option 4 ID : **6306802538439**

Q.18 Voltage and current in an AC circuit are $v = 100\sin(314t + 45°)$ and $i = 10\sin(314t - 45°)$. What is the real power associated in the circuit?

Ans
1. 500 W ✗
2. 0 ✓
3. 1000 W ✗
4. 100 W ✗

Question ID : **630680648307**
Option 1 ID : **6306802538433**
Option 2 ID : **6306802538431**
Option 3 ID : **6306802538432**
Option 4 ID : **6306802538434**

Q.19 In a hydro-electric plant, power produced is 500 kW when the water head is 100 m. What would be the power produced if the head is increased to 125 m?

Ans
1. 625 kW ✓
2. 750 kW ✗
3. 500 kW ✗
4. 400 kW ✗

Question ID : **630680648304**
Option 1 ID : **6306802538422**
Option 2 ID : **6306802538419**
Option 3 ID : **6306802538420**
Option 4 ID : **6306802538421**

Q.20 In a conic section, a straight line perpendicular to the major axis is called _____.

Ans
1. minor axis ✗
2. focus ✗
3. directrix ✓
4. focal radii ✗

Question ID : **630680648285**
Option 1 ID : **6306802538345**
Option 2 ID : **6306802538344**
Option 3 ID : **6306802538346**
Option 4 ID : **6306802538343**

Section : **Section B3**

Q.1 In a single-phase half-wave-controlled rectifier, the RMS value of the load voltage is 50% of the amplitude of the input voltage, and the average voltage is 40% of the amplitude of the input voltage. What is the form factor?

Ans

✔ 1. 125%

✘ 2. 80%

✘ 3. 250%

✘ 4. 20%

Question ID : **630680648267**
Option 1 ID : **6306802538274**
Option 2 ID : **6306802538273**
Option 3 ID : **6306802538271**
Option 4 ID : **6306802538272**

Q.2 Under what condition will the output of a 2 input NAND gate be low?

Ans

✘ 1. When one of the inputs is high

✘ 2. When both inputs are high and low

✘ 3. When both inputs are low

✔ 4. When both inputs are high

Question ID : **630680648297**
Option 1 ID : **6306802538394**
Option 2 ID : **6306802538393**
Option 3 ID : **6306802538392**
Option 4 ID : **6306802538391**

Q.3 A single-phase full-bridge inverter with an input voltage of 20 V is feeding a resistive load of 10 Ω. What is the fundamental output voltage?

Ans

✘ 1. $\frac{40\sqrt{2}}{3\pi}$ V

✘ 2. $\frac{40}{3\pi}$ V

✘ 3. $\frac{40}{\pi}$ V

✔ 4. $\frac{40\sqrt{2}}{\pi}$ V

Question ID : **630680648268**
Option 1 ID : **6306802538276**
Option 2 ID : **6306802538278**
Option 3 ID : **6306802538277**
Option 4 ID : **6306802538275**

Q.4 A step-down DC chopper has an input voltage of 100 V and supplies a resistive load of 10 Ω. Neglecting the voltage drop, what is the average value of output voltage for a duty ratio of 0.5?

Ans

✗ 1. 25 V

✗ 2. 60 V

✗ 3. 75 V

✓ 4. 50 V

Question ID : **630680648319**
Option 1 ID : **6306802538479**
Option 2 ID : **6306802538482**
Option 3 ID : **6306802538481**
Option 4 ID : **6306802538480**

Q.5 In a silicon atom, if the energy level of the second orbit is 0.3 eV, that of the third orbit is 0.7 eV, and that of the conduction band is 1.8 eV, then what is the energy needed to make an electron to jump from the valence band to the conduction band?

Ans

✗ 1. 1.4 eV

✗ 2. 1.8 eV

✗ 3. 1.5 eV

✓ 4. 1.1 eV

Question ID : **630680648238**
Option 1 ID : **6306802538155**
Option 2 ID : **6306802538157**
Option 3 ID : **6306802538158**
Option 4 ID : **6306802538156**

Q.6 A three-phase inverter fed from a 400 V DC supply is operated in 180° conduction mode and is supplying a star-connected resistive load. What is the rms value of the fundamental component of line voltage?

Ans

✗ 1. 288 V

✗ 2. 382 V

✗ 3. 364 V

✓ 4. 312 V

Question ID : **630680648318**
Option 1 ID : **6306802538476**
Option 2 ID : **6306802538477**
Option 3 ID : **6306802538475**
Option 4 ID : **6306802538478**

Q.7 What is the hexadecimal equivalent of the decimal number 0.75?

Ans
1. 0.E
2. 0.D
3. 0.B
4. 0.C

Question ID : **630680648294**
Option 1 ID : **6306802538382**
Option 2 ID : **6306802538380**
Option 3 ID : **6306802538381**
Option 4 ID : **6306802538379**

Q.8 (AC + BC) is the simplified form of which of the following Boolean expressions?

Ans
1. $\overline{\overline{A} + \overline{B} + \overline{BC}}$
2. $\overline{\overline{A} + \overline{B} + \overline{C}}$
3. $\overline{\overline{A} + \overline{B} + \overline{AC}}$
4. $\overline{\overline{A} + \overline{B} + C}$

Question ID : **630680648246**
Option 1 ID : **6306802538189**
Option 2 ID : **6306802538187**
Option 3 ID : **6306802538190**
Option 4 ID : **6306802538188**

Q.9 A power transformer is operating with a maximum flux density of 1.25 Wb/m^2. The hysteresis loss in the magnetic material is proportional to _____.

Ans
1. $1.25^{2.5}$
2. $1.25^{1.2}$
3. $1.25^{1.6}$
4. 1.25^{2}

Question ID : **630680648287**
Option 1 ID : **6306802538351**
Option 2 ID : **6306802538353**
Option 3 ID : **6306802538354**
Option 4 ID : **6306802538352**

Q.10 The magnetic flux density within a bar of some material is 0.5 Tesla at an H field of 5×10^5 A/m. What is the magnetic permeability for this material?

Ans
1. 1×10^{-6} H/m
2. 2.5×10^{-5} H/m
3. 1×10^{-5} H/m
4. 2.5×10^{-6} H/m

Question ID : **630680648241**
Option 1 ID : **6306802538167**
Option 2 ID : **6306802538168**
Option 3 ID : **6306802538169**
Option 4 ID : **6306802538170**