

**S. Y. B. Sc. SEM III**  
**Physics Paper II**  
**Sample Questions**

1) If value of  $\oint \vec{F} \cdot \vec{dr}$  is independent of path, the vector field  $\vec{F}$  is said to be,

- a) rotational                      b) conservative  
c) non-solenoidal                d) non-conservative

2) In cylindrical coordinates:

- a)  $r: 0 \rightarrow \infty$ ,       $\Phi: 0 \rightarrow 2\pi$ ,       $z: -\infty \rightarrow \infty$   
b)  $r: 0 \rightarrow \infty$ ,       $\Phi: 0 \rightarrow \pi$ ,       $z: 0 \rightarrow +\infty$   
c)  $r: -\infty \rightarrow \infty$ ,       $\Phi: 0 \rightarrow \pi/2$ ,       $z: r$   
d)  $r: 0 \rightarrow -\infty$ ,       $\Phi: 0 \rightarrow 3\pi/2$ ,       $z: 0 \rightarrow \infty$

3) In spherical polar coordinate system unit vectors are

- a) mutually perpendicular to each other    b) not mutually orthogonal    c) perpendicular  $\hat{r}$  to except  $\hat{\theta}$   
d) none of these

4) The gradient of function  $x^2 + y^2 + z^2$  at (1, 1, 1) is

- a)  $\hat{i} + \hat{j} + \hat{k}$     b)  $2\hat{i} + 2\hat{j} + 2\hat{k}$     c)  $2x\hat{i} + 2y\hat{j} + 2z\hat{k}$     d)  $4x\hat{i} + 2y\hat{j} + 4z\hat{k}$

5) The operating point is also called the -----

- (a) Cut off point    (b) Quiescent point                      (c) Saturation point                      (d) none of these

6) Thermal runaway occurs when -----

- a) collector is reverse biased    b) transistor is not biased    c) emitter is forward biased  
d) junction capacitance is high

7) For faithful amplification by a transistor circuit the value of  $V_{CE}$  should ----- for germanium transistor

- a) not fall below 0.7V    b) be zero    c) be 0.2 V    d) none of these

8) The stability factor of a collector feedback bias circuit is ----- that of base resistor bias.

- a) the same as    b) more than    c) less than    d) none of these

9) In the designing of a biasing circuit the value of collector load  $R_C$  is depends upon -----

- a)  $V_{CE}$  consideration    b)  $V_{BE}$  consideration    c)  $I_B$  consideration    d) none of these

10) A CE amplifier produces -----

- a) phase reversal    b) non- phase reversal    c) maximum reversal    d) minimum reversal

11) Voltage gain of an amplifier without feedback is 60 dB. It decreases to 40 dB with feedback. Hence the value of feedback factor is

- a)  $9 \times 10^{-4}$     b)  $9 \times 10^{-3}$     c)  $6 \times 10^{-4}$     d)  $6 \times 10^{-3}$

- 12) The cut-off frequencies are called ----- frequencies  
 a) half- power b) full-power c) quarter-power d) none of these
- 13) The decibel voltage gain at cut-off frequency is ----- less than the decibel voltage gain in the mid-frequency region  
 a) 3 dB b) 3 dB c) 3 dB d) 3 dB
- 14) For sustained sinusoidal oscillations, total loop gain should be  
 a) 0 b)  $\infty$  c) 1 d) -1.
- 15) An oscillator is -----  
 (a) An electronic source of alternating current or voltage having sine, square or saw tooth or pulse shapes  
 (b) A circuit which analyzes dc.  
 (c) A circuit which converts ac to dc.  
 (d) A circuits which regulates voltage.
- 16) An electronic oscillator is an amplifier with ----- feedback.  
 a) negative b) positive c) positive and negative d) none of these.
- 17) An oscillator produces ----- oscillations  
 a) damped b) undamped c) modulated d) none of these
- 18) An oscillator employs ----- feedback  
 a) positive b) negative c) neither positive nor negative d) data insufficient
- 19) Hartley oscillator is commonly used in -----  
 a) radio receiver b) radio transmitter c) TV receiver d) none of these
- 20) An amplifier differs from an amplifier because it -----  
 a) has more gain b) requires no input signal c) requires no dc signal d) always has the same input
- 21) The signal generator generally used in the laboratories is ----- oscillator  
 a) Wien – bridge b) Hartley c) Crystal d) Phase shift
- 22) The voltage follower circuit using op-amp can be represented by the equation  
 a)  $V_o = V_i$  b)  $V_o = (-\frac{R_f}{R_i}) V_i$  c)  $V_o = \int V_i dt$  d)  $V_o = (1 - \frac{R_f}{R_i}) V_i$
- 23) An ideal op-amp has -----  
 a) infinite input and output resistance  
 b) infinite CMRR and zero temperature drift  
 c) zero input resistance and zero slew rate  
 d) output resistance and large offset voltage
- 24) An ideal op-amp has input resistance ----- and output resistance -----  
 a) low, infinite b) infinite, zero c) low, low d) infinite, infinite

25) ----- circuit is used as a buffer amplifier

- a) Inverting amplifier   b) Non-inverting amplifier   c) Voltage follower   d) none of these