# Sample Paper

## Physics USPH302 : Vector calculus, Analog Electronics

1. If biasing is not done in an amplifier circuit, it results in ……

(i) Decrease in the base current

(ii) Unfaithful amplification

(iii) Excessive collector bias

(iv) betteramplificaion

2. The disadvantage of base resistor method of transistor biasing is that it ……

(i) Is complicated

(ii) Is sensitive to changes in β

(iii) Provides high stability

(iv) gain is samll

3.The value of stability factor for a base resistor bias is ……

(i) $R_B$ (β+1)

(ii) (β+1)$R_C$

(iii) (β+1)

(iv) 1-β

4. Ideally the input resistance of an amplifier is _____.

(i) infinite

(ii) zero

(iii) less than 500 Ω

(iv) less than 1000 Ω

5. The phase relationship between input and output of CE Amplifier is ____.

(i) 0°

(ii) 90°

(iii) 180°

(iv) 270°

6. Oscillator make use of _____ feedback.

(i) positive

(ii) negative

(iii) voltage divider

(iv) no

7. Maximum frequency produced in Wien Bridge Oscillator is _____.

(i) 100 MHz

(ii) 10 MHz

(iii) 1000 MHz

(iv) 1 MHz

8. The formula for frequency of oscillation of Colpitt's oscillator is :

(i) $f = \frac{1}{2\pi RC}$

(ii) $f = \frac{1}{2\pi LC}$

(iii) $f = \frac{1}{2\pi\sqrt{LC}}$

(iv)$f = \frac{1}{2\pi\sqrt{RC}}$

9. Gain of voltage follower is _____

(i) 1

(ii) 10

(iii) 20

(iv) 50

10. Formula for slew rate is _____

(i) $S = \frac{\Delta V}{\Delta T}$

(ii) $S = \frac{\Delta T}{\Delta V}$

(iii) $S = \frac{\Delta I}{\Delta T}$

(iv)$S = \frac{\Delta T}{\Delta I}$

11 The line integral of the vector function $2x^2\hat{\imath} + 2xy\hat{\jmath}$ from (0,0) to (1,0) is

i. 1
ii. 2
iii. ½
iv. 2/3

12 The gradient of the function $e^x$ + sin y is

i. $e^x\hat{\imath} + \cos y\,\hat{\jmath}$
ii. $-2e^x\hat{\imath} - \cos y\,\hat{\jmath}$
iii. $\cos y\,\hat{\jmath}$
iv. $e^x\hat{\imath}$

13 The value of $\int_0^1 \int_0^1 \int_0^1 x\,dx\,dy\,dz\,is$

i. 2
ii. 1
iii. ½
iv. 1/3

14 In sphericalcoordinatesystem the line elements are

i. dx, dy, dz
ii. dr , dθ, dϕ
iii. dr, rdθ, rsinθdϕ
iv. r, θ, ϕ

15. Thecoordinates in cylindrical coordinate system are

i. x, y, z
ii. r, θ, ϕ
iii. r, ϕ, z
iv. x, y, ϕ