R. T. M. NAGPUR UNIVERSITY, NAGPUR

KAMLA NEHRU MAHAVIDYALAYA, NAGPUR

Department of Physics

B.Sc. SEM VI

Subject-Physics: Paper-II

QUESTION BANK

1. A differential amplifier ……..

(a) is a part of an Op-amp
(b) has one input and one output
(c) has two outputs
(d) answers (1) and (2)

2. When a differential amplifier is operated single-ended …

(a) the output is grounded
(b) one input is grounded and signal is applied to the other
(c) both inputs are connected together
(d) the output is not inverted

3. With zero volts on both inputs, an OP-amp ideally should have an output ……..

(a) equal to the positive supply voltage
(b) equal to the negative supply voltage
(c) equal to zero
(d) equal to CMRR

4. For an Op-amp with negative feedback, the output is …….

(a) equal to the input
(b) increased
(c) fed back to the inverting input
(d) fed back to the non-inverting input

5. Which of the following electrical characteristics is not exhibited by an ideal op-amp?

(a) Infinite voltage gain
(b) Infinite bandwidth
(c) Infinite output resistance
(d) Infinite slew rate

6. Ideal op-amp has infinite voltage gain because

(a) To control the output voltage
(b) To obtain finite output voltage
(c) To receive zero noise output voltage
(d) None of the mentioned

7. In an LC transistor oscillator, the active device is ……

(a) LC tank circuit
(b) Biasing circuit
(c) Transistor
(d) None of the above

8. Hartley oscillator is commonly used in ……

(a) Radio receivers
(b) Radio transmitters
(c) TV receivers
(d) None of the above

9. In a phase shift oscillator, we use ……. RC sections

(a) Two
(b) Three
(c) Four
(d) None of the above

10. A Wien bridge oscillator uses ……. Feedback

(a) Only positive
(b) Only negative
(c) Both positive and negative
(d) None of the above

11. Multimode step index fibre has _____

(a) Large core diameter & large numerical aperture
(b) Large core diameter and small numerical aperture
(c) Small core diameter and large numerical aperture
(d) Small core diameter & small numerical aperture

12. Multimode graded index fibres use incoherent source only.

(a) True
(b) False

13. What is the principle of fibre optical communication?

(a) Frequency modulation
(b) Population inversion
(c) Total internal reflection
(d) Doppler Effect

14. What is the other name for a maximum external incident angle?

(a) Optical angle
(b) Total internal reflection angle
(c) Refraction angle
(d) Wave guide acceptance angle

15. How does the refractive index vary in Graded Index fibre?

(a) Tangentially
(b) Radially
(c) Longitudinally
(d) Transversely

16. Which of the following has more distortion?

(a) Single step-index fibre
(b) Graded index fibre
(c) Multimode step-index fibre
(d) Glass fibre

17. In single mode fibres, which is the most beneficial index profile?

(a) Step index
(b) Graded index
(c) Step and graded index
(d) Coaxial cable

18. Multimode graded index fibres have overall buffer jackets same as multimode step index fibres but have core diameters _____

(a) Larger than multimode step index fibres
(b) Smaller than multimode step index fibres
(c) Same as that of multimode step index fibres
(d) Smaller than single mode step index fibres

19. In single-mode fibres, how does the fraction of energy traveling through bound mode appear in the cladding?

(a) As a crescent wave
(b) As a gibbous wave
(c) As an evanescent wave
(d) All of the above

20. In an optical fibre, the concept of Numerical aperture is applicable in describing the ability of _____

(a) Light Collection
(b) Light Scattering
(c) Light Dispersion
(d) Light Polarization

21. In Amplitude Modulation, the instantaneous values of the carrier amplitude changes in accordance with the amplitude and frequency variations of the modulating signal.

(a) True (b) False

22. What is the reference line for the modulating signal?

(a) Zero line (b) Carrier peak line

(c) Modulated peak line (d) Un-modulated peak line

23. What happens when the amplitude of the modulating signal is greater than the amplitude of the carrier?

(a) Decay (b) Distortion

(c) Amplification (d) Attenuation

24. Modulation index of an AM signal is ratio of _____ to the _____Peak carrier amplitude, Peak message signal amplitude

(a) Peak message signal amplitude, Peak carrier amplitude (b) Carrier signal frequency, Message signal frequency

(c) Message signal frequency, Carrier signal frequency (d) None of the above

25. The RF bandwidth of AM is _____ the maximum frequency contained in the modulating message signal.

(a) Equal (b) Two times

(c) Four times (d) Ten times

26. In Frequency Modulation –

(a) Amplitude of the carrier remains same (b) Frequency of the carrier varies in accordance with the modulating signal

(c) The number of side bands are infinite (d) All of the above

27. Carrier swing is defined as

(a) The total variation in frequency from the lowest to the highest point (b) Frequency deviation above or below the carrier frequency

(c) Width of the side band (d) None of the above

28. The amount of frequency deviation in FM signal depends on

(a) Amplitude of the modulating signal (b) Carrier frequency

(c) Modulating frequency (d) Transmitter amplifier

29. Advantage of using direct method for generation of FM signal is

(a) It gives high stability to FM signal frequency
(b) Distortion free FM signal is generated
(c) High power FM generation is possible
(d) None of the above

30. Sensitivity is defined as

(a) Ability of receiver to amplify weak signals
(b) Ability to reject unwanted signals
(c) Ability to convert incoming signal into Image Frequency
(d) Ability to reject noise

31. Any signed negative binary number is recognised by its _____

(a) MSB
(b) LSB
(c) Byte
(d) Nibble

32. If the decimal number is a fraction then its binary equivalent is obtained by _____ the number continuously by 2.

(a) Dividing
(b) Multiplying
(c) Adding
(d) Subtracting

33. The representation of octal number $(532.2)_8$ in decimal is _____

(a) $(346.25)_{10}$
(b) $(532.864)_{10}$
(c) $(340.67)_{10}$
(d) $(531.668)_{10}$

34. The decimal equivalent of the binary number $(1011.011)_2$ is _____

(a) $(11.375)_{10}$
(b) $(10.123)_{10}$
(c) $(11.175)_{10}$
(d) $(9.23)_{10}$

35. An important drawback of binary system is _____

(a) It requires very large string of 1's and 0's to represent a decimal number
(b) It requires sparingly small string of 1's and 0's to represent a decimal number
(c) It requires large string of 1's and small string of 0's to represent a decimal number
(d) It requires small string of 1's and large string of 0's to represent a decimal number

36. The largest two digit hexadecimal number is _____

(a) $(FE)_{16}$
(b) $(FD)_{16}$
(c) $(FF)_{16}$
(d) $(EF)_{16}$

37. How many AND gates are required to realize Y = CD + EF + G?

(a) 4 (b) 5

(c) 3 (d) 2

38. A universal logic gate is one which can be used to generate any logic function. Which of the following is a universal logic gate?

(a) OR (b) AND

(c) XOR (d) NAND

39. The gates required to build a half adder are _____

(a) EX-OR gate and NOR gate (b) EX-OR gate and OR gate

(c) EX-OR gate and AND gate (d) EX-NOR gate and AND gate

40. Logic Gates are the building blocks of all circuits in a computer

(a) True (b) False