PYQSide PYQSide.com — free PYQs with solutions Powered by TestBlink

NEET SEMICONDUCTOR ELECTRONICS — JUNCTION TRANSISTOR AND AMPLIFIER (OLD SYLLABUS) — PYQS

Max. Marks: 88 **Questions:** 22

Section A (MCQ) — 22 questions

Q.1 The collector current in a common base amplifier using n-p-n transistor is 24 mA. If 80% of the electrons released by the emitter is accepted by the collector, then the base current is numerically : [NEET (UG) 2022 (Phase 2)]

(1) 3 mA and entering the base
(2) 6 mA and leaving the base
(3) 3 mA and leaving the base
(4) 6 mA and entering the base

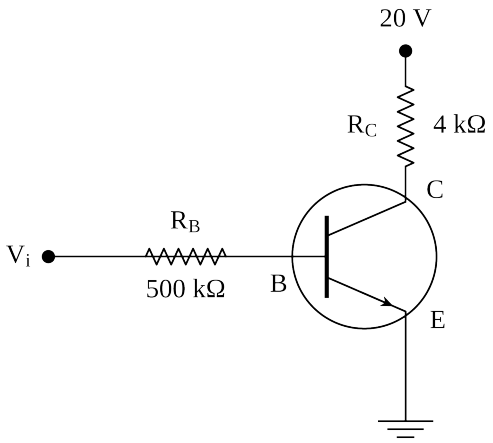
Scan or tap for the full solution

Q.2 For transistor action, which of the following statements is **correct**? [NEET (UG) 2020]

(1) Base, emitter and collector regions should have same size.
(2) Both emitter junction as well as the collector junction are forward biased.
(3) The base region must be very thin and lightly doped.
(4) Base, emitter and collector regions should have same doping concentrations.

Scan or tap for the full solution

Q.3 In the circuit shown in the figure, the input voltage V_i is 20 V, $V_{BE} = 0$ and $V_{CE} = 0$. The values of I_B, I_C and β are given by [NEET 2018]



(1) $I_B = 40\ \mu A$, $I_C = 10$ mA, $\beta = 250$
(2) $I_B = 25\ \mu A$, $I_C = 5$ mA, $\beta = 200$
(3) $I_B = 20\ \mu A$, $I_C = 5$ mA, $\beta = 250$
(4) $I_B = 40\ \mu A$, $I_C = 5$ mA, $\beta = 125$

Scan or tap for the full solution

Q.4 In a common emitter transistor amplifier the audio signal voltage across the collector is 3 V. The resistance of collector is 3 kΩ. If current gain is 100 and the base resistance is 2 kΩ, the voltage and power gain of the amplifier is [NEET 2017]

(1) 15 and 200 (2) 150 and 15000
(3) 20 and 2000 (4) 200 and 1000

Scan or tap for the full solution

Q.5 A npn transistor is connected in common emitter configuration in a given amplifier. A load resistance of 800 Ω is connected in the collector circuit and the voltage drop across it is 0.8 V. If the current amplification factor is 0.96 and the input resistance of the circuit is 192 Ω, the voltage gain and the power gain of the amplifier will respectively be [NEET 2016 (Phase 1)]

(1) 4, 4 (2) 4, 3.69 (3) 4, 3.84 (4) 3.69, 3.84

Scan or tap for the full solution

Q.6 For CE transistor amplifier, the audio signal voltage across the collector resistance of 2 kΩ is 4 V. If the current amplification factor of the transistor is 100 and the base resistance is 1 kΩ, then the input signal voltage is [NEET 2016 (Phase 2)]

(1) 10 mV (2) 20 mV (3) 30 mV (4) 15 mV

Scan or tap for the full solution

Q.7 The input signal given to a CE amplifier having a voltage gain of 150 is $V_i = 2\cos\left(15t + \frac{\pi}{3}\right)$. The corresponding output signal will be [AIPMT 2015]

(1) $2\cos\left(15t+\frac{5\pi}{6}\right)$ (2) $300\cos\left(15t+\frac{4\pi}{3}\right)$

(3) $300\cos\left(15t+\frac{\pi}{3}\right)$ (4) $75\cos\left(15t+\frac{2\pi}{3}\right)$

Scan or tap for the full solution

Q.8 In a common emitter (CE) amplifier having a voltage gain G, the transistor used has transconductance 0.03 mho and current gain 25. If the above transistor is replaced with another one with transconductance 0.02 mho and current gain 20, the voltage gain will be [NEET 2013]

(1) $\frac{1}{3}$ G (2) $\frac{5}{4}$ G (3) $\frac{2}{3}$ G (4) 1.5G

Scan or tap for the full solution

Q.9 One way in which the operation of an n-p-n transistor differs from that of a p-n-p is [NEET 2013 (Karnataka)]

(1) The emitter junction injects minority carriers into the base region of the p-n-p

(2) The emitter injects holes into the base of the p-n-p and electrons into the base region of n-p-n

(3) The emitter injects holes into the base of n-p-n

(4) The emitter junction is reverse biased in n-p-n

Scan or tap for the full solution

Q.10 The input resistance of a silicon transistor is 100 Ω. Base current is changed by 40 μA which results in a change in collector current by 2 mA. This transistor is used as a common emitter amplifier with a load resistance of 4 kΩ. The voltage gain of the amplifier is [AIPMT 2012 (Mains)]

(1) 2000 (2) 3000 (3) 4000 (4) 1000

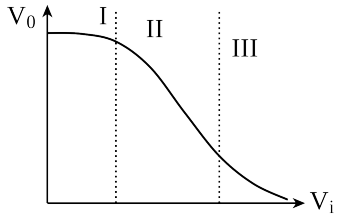
Scan or tap for the full solution

Q.11 In a CE transistor amplifier, the audio signal voltage across the collector resistance of 2 kΩ is 2 V. If the base resistance is 1 kΩ and the current amplification of the transistor is 100, the input signal voltage is [AIPMT 2012 (Prelims)]

(1) 0.1 V (2) 1.0 V (3) 1 mV (4) 10 mV

Scan or tap for the full solution

Q.12 Transfer characteristics [output voltage (V_0) vs input voltage (V_i)] for a base biased transistor in CE configuration is as shown in the figure. For using transistor as a switch, it is used [AIPMT 2012 (Prelims)]



(1) in region III

(2) both in region (I) and (III)

(3) in region II

(4) in region I

Scan or tap for the full solution

Q.13 A transistor is operated in common emitter configuration at V_C = 2 V such that a change in the base current from 100 μA to 300 μA produces a change in the collector current from 10 mA to 20 mA. The current gain is [AIPMT 2011 (Prelims)]

(1) 50 (2) 75 (3) 100 (4) 25

Scan or tap for the full solution

Q.14 For transistor action

Which one of the following pairs of statements is correct?

A. Base, emitter and collector regions should have similar size and doping concentrations.

B. The base region must be very thin and lightly doped.

C. The emitter-base junction is forward biased and base-collector junction is reverse biased.

D. Both the emitter-base junction as well as the base-collector junction are forward biased.

[AIPMT 2010 (Mains)]

(1) D and A (2) A and B (3) B and C (4) C and D

Scan or tap for the full solution

Q.15 A common emitter amplifier has a voltage gain of 50, an input impedance of 100 Ω and an output impedance of 200 Ω. The power gain of the amplifier is [AIPMT 2010 (Prelims)]

(1) 500 (2) 1000 (3) 1250 (4) 50

Scan or tap for the full solution

Q.16 A transistor is operated in common-emitter configuration at V_C = 2 V such that a change in the base current from 100 μA to 200 μA produces a change in the collector current from 5 mA to 10 mA. The current gain is [AIPMT 2009]

(1) 100 (2) 150 (3) 50 (4) 75

Scan or tap for the full solution

Q.17 The voltage gain of an amplifier with 9% negative feedback is 10. The voltage gain without feedback will be [AIPMT 2008]

(1) 1.25 (2) 100 (3) 90 (4) 10

Scan or tap for the full solution

Q.18 A transistor is operated in common emitter configuration at constant collector voltage V_C = 1.5 V such that a change in the base current from 100 μA to 150 μA produces a change in the collector current from 5 mA to 10 mA. The current gain β is [AIPMT 2006]

(1) 50 (2) 67 (3) 75 (4) 100

Scan or tap for the full solution

Q.19 An n-p-n transistor conducts when [AIPMT 2003]

(1) both collector and emitter are positive with respect to the base

(2) collector is positive and emitter is negative with respect to the base

(3) collector is positive and emitter is at same potential as the base

(4) both collector and emitter are negative with respect to the base

Scan or tap for the full solution

Q.20 For a transistor $\frac{I_C}{I_E} = 0.96$, then current gain for common emitter is [AIPMT 2002]

(1) 12 (2) 6 (3) 48 (4) 24

Scan or tap for the full solution

Q.21 For a common base circuit if $\frac{I_C}{I_E} = 0.98$ then current gain for common emitter circuit will be [AIPMT 2001]

(1) 49 (2) 98 (3) 4.9 (4) 25.5

Scan or tap for the full solution

Q.22 The correct relation between α and β for a transistor is [AIPMT 2000]

(1) $\beta = \frac{1-\alpha}{\alpha}$ (2) $\beta = \frac{\alpha}{1-\alpha}$

(3) $\alpha = \frac{\beta - 1}{\beta}$ (4) $\alpha\beta = 1$

Scan or tap for the full solution

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	**4**	**3**	**4**	**2**	**3**	**2**	**2**	**3**	**2**	**1**	**4**
Ques.	12	13	14	15	16	17	18	19	20	21	22
Ans.	**2**	**1**	**3**	**3**	**3**	**2**	**4**	**2**	**4**	**1**	**2**