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Et-304/EEtE/3rd Sem/2018/M

**ELEMENTS OF ELECTRONICS
ENGINEERING**

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks
for the questions.

FIRST PART

Marks – 25

1. Fill in the blanks : 1×15=15
- (i) The electrode of a tube from where the electrons are emitted is called _____.
 - (ii) In vacuum tubes _____ emission is used.
 - (iii) An electronic device that converts AC into DC is called a _____.

[Turn over

- (iv) A vacuum diode conducts only when plate is _____ w.r.t. cathode.
- (v) For half wave rectification _____ vacuum diode is needed.
- (vi) Tube used for amplification must have _____ grid.
- (vii) For faithful amplification, the control grid must be kept at _____ potential w.r.t. cathode.
- (viii) A semiconductor has a _____ temperature co-efficient of resistance.
- (ix) In a transistor, base is made very _____.
- (x) Class _____ power amplifier has the highest collector efficiency.
- (xi) The last stage of an audio amplifier is called _____.
- (xii) A capacitor circuit does not allow passing _____ components.

(xiii) Negative feedback in an amplifier increases the _____ of its voltage gain.

(xiv) To obtain undamped oscillations _____ feedback is necessary.

(xv) In a transistor, _____ is made most highly doped section.

2. Select the correct answers in the following :

1×5=5

- (i) In an NPN transistor with normal bias
- (a) Only holes cross the collector junction
 - (b) Only majority carriers cross the collector junction.
 - (c) The emitter resistance has a high resistance.
 - (d) The emitter junction is forward biased and collector junction is reverse biased.

(ii) The silicon transistors are more widely used than germanium transistors because

- (a) They have smaller leakage current
- (b) They have better ability to dissipate heat.
- (c) They have smaller depletion layers.
- (d) They have larger current carrying capacity.

(iii) The maximum efficiency of class B amplifier is

- (a) 50%
- (b) 78.5%
- (c) 35%
- (d) 100%

(iv) In push-pull amplifiers, usually biasing is not required because

- (a) DC battery V_{CC} is employed
- (b) Power transistors do not require biasing
- (c) Heat sink is used with the transistors
- (d) Transistors are working in class B operation.

- (v) An oscillator is a
- (a) Rotating device
 - (b) Static electronic device
 - (c) Rotating electronic device
 - (d) Electro-mechanical device

3. State true or false : 1×5=5

- (i) To be a good emitter the cathode material should have low work function.
- (ii) In a transistor, there are three PN junctions.
- (iii) When PN junction is forward biased, it offers low resistance and larger current flows through it.
- (iv) In transistor circuit, $I_E = I_B + \beta I_B$
- (v) Avalanche breakdown in a crystal diode occurs when reverse bias exceeds a certain value.