

# C.U.SHAH UNIVERSITY

## Summer Examination-2016

**Subject Name: Applied Physics**

**Subject Code: 4TE02APH1**

**Branch: B.Tech(All)**

**Semester: 2**

**Date: 11/05/2016**

**Time: 10:30 To 1:30**

**Marks: 70**

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
  - (2) Instructions written on main answer book are strictly to be obeyed.
  - (3) Draw neat diagrams and figures (if necessary) at right places.
  - (4) Assume suitable data if needed.
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**Q-1**

**Attempt the following questions:**

**(14)**

- a) Which type of impurity is added in intrinsic semiconductor to form an n-type semiconductor?
- b) Which are the majority and minority charge carriers in P-type semiconductor?
- c) In a diode circuit, the voltage drop across diode is  $0.5 V$  in its on condition and current passing through diode is  $2 mA$ . Determine static resistance of the diode.
- d) Determine the forward voltage drop and forward resistance across an ideal diode.
- e) If the reverse bias voltage across diode increases, transition capacitance of a diode increases Determine whether given statement is true or false.
- f) Draw the symbol of photo diode and its characteristics.
- g) A half wave rectifier is supplied from  $v_s = V_m \sin \omega t$ ,  $50 Hz$  supply connected with a step down transformer. If  $V_m$  is the maximum voltage across the transformer secondary. Determine peak inverse voltage (PIV) across the diode.
- h) Draw the symbol of npn and pnp transistor and indicate various current directions.
- i) A transistor has a current gain ( $\beta$ ) of 175. If the base current is  $0.1 mA$ , what is the collector current?
- j) A BJT is a current controlled device and JFET is also a current controlled device.





is  $50 \Omega$ , while transformer secondary resistance is  $15 \Omega$ . Calculate,

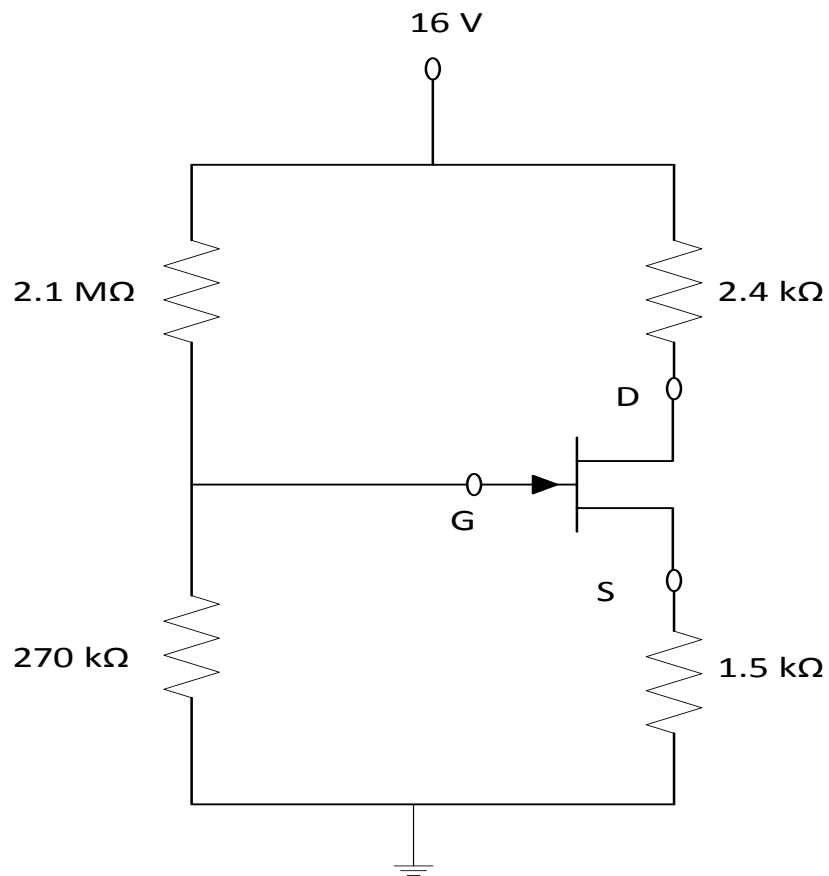
- i) Maximum value of load current
- ii) Average value of load current
- iii) RMS value of load current
- iv) DC output power
- v) Rectifier efficiency

**Q-6**      **Attempt all questions**      **(14)**

(a) Draw the circuit of common emitter configuration for BJT. Draw its input and output characteristics and only explain regions of output characteristics.      **07**

(b) Determine the following parameters for the below network.      **07**

- i)  $I_{DQ}$  and  $V_{GSQ}$
- ii)  $V_{DS}$



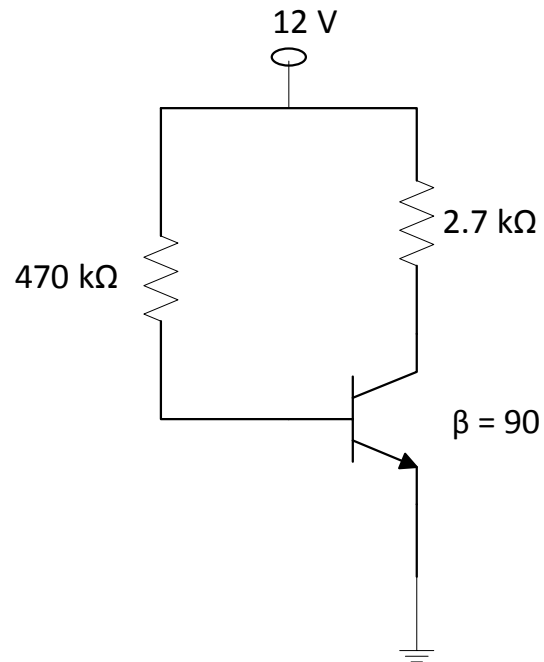
**Q-7**      **Attempt all questions**      **(14)**



(a) Draw the construction of n-channel depletion type MOSFET and explain its 07

operation. Draw its V-I characteristics and transfer characteristics.

(b) Determine the value of  $I_B$ ,  $I_C$  and  $V_{CE}$  for  $\beta = 90$  for the below circuit. 07



**Q-8** **Attempt all questions** **(14)**

(a) Compare spontaneous emission and stimulated emission for LASER. 07

(b) Explain various types of optical fiber configuration. 07

