MS – 361

II Semester B.Sc. Examination, May 2016
(CBCS)
(F + R) (2014 – 15 and Onwards)
ELECTRONICS – II
Electronic Circuits and Special Purpose Devices

Time : 3 Hours | Max. Marks : 70

Instruction : *Answer **all** the questions from Part – **A**, **any five** questions from Part – **B**, and **any four** questions from Part – **C**.*

Note : *It is required to answer **all** the questions of Part – **A** in **any one** page and to be answered only once. In this Part, answering the **same** question multiple times will **not** be considered for Evaluation.*

PART – A

Answer **all** the subdivisions. **(15×1 = 15)**

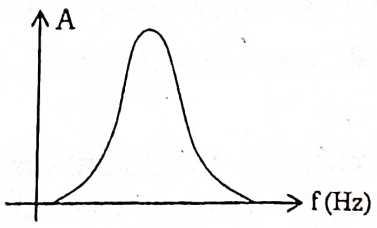
1. i) When the emitter bypass capacitor is removed in a common-emitter amplifier, the voltage gain

   a) increases
   b) decreases
   c) remains unaltered
   d) drops to zero

   ii) In direct coupled amplifier, the lower cutoff frequency is

   a) 10 kHz b) 100 kHz c) 0 Hz d) Infinity

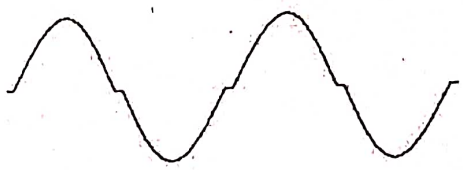
   iii) Following is the frequency response curve of _____



   a) Single tuned amplifier
   b) Double tuned amplifier
   c) Direct coupled amplifier
   d) RC coupled amplifier

iv) For an ideal differential amplifier, the C.M.R.R. is _____
a) zero b) low c) infinity d) high

v) Output signal of a power amplifier is shown below. The type of distortion involved is _____



a) Crossover distortion
b) Amplitude distortion
c) Frequency distortion
d) Harmonic distortion

vi) Bandwidth of an amplifier with negative feedback _____
a) increases b) decreases
c) remains constant d) becomes infinity

vii) A stable Multivibrator has
a) two stable states b) single stable state
c) no stable state d) none of the above

viii) The only drawback of negative feedback amplifiers is _____
a) decreased gain b) decreased distortion in the signal
c) stabilised gain d) increased bandwidth

ix) _____ produces highly stable frequency of oscillations.
a) Crystal Oscillator b) Colpitt's Oscillator
c) Hartley Oscillator d) None of the above

x) Tunnel diode is basically _____
a) a very heavily doped PN junction diode
b) a very lightly doped PN junction diode
c) a moderately doped PN junction diode
d) none of the above

xi) In the construction of UJT, Emitter contact is always
a) Nearer to Base 1
b) Nearer to Base 2
c) Exactly in the middle of the channel
d) Always attached to Base 1

xii) In a seven segment LED display if a, b, c, d, e, f segments are activated, the decimal number displayed is _____

a) Zero b) Five c) Eight d) Nine

xiii) A device that exhibits a negative resistance region is

a) pn diode b) tunnel diode c) varactor diode d) solar cell

xiv) Following is the circuit symbol for

a) Schottky diode
b) Varactor diode
c) Photo diode
d) None of the diode

xv) TRIAC is a device which conducts during

a) positive half cycles of the input signal
b) negative half cycles of the input signal
c) both positive and negative half cycles of the input signal
d) alternate positive half cycles of the input signal

PART – B

Answer **any five** questions. **(5×7 = 35)**

2. a) Classify the amplifiers based on any four different criteria.

   b) Draw the circuit of a CC amplifier and write its any two applications. **(4+3)**

3. a) Draw the circuit diagram of two stage RC Coupled amplifier. Draw its frequency response curve. Mention its advantages.

   b) Draw the circuit diagram of a swamped amplifier. **(5+2)**

4. a) Compare voltage and power amplifiers.

   b) Draw the circuit of a Class B Push Pull power amplifier and explain its working. **(3+4)**

5. Draw the circuit of a differential amplifier with current mirror. What is the effect of current mirror on differential gain, common mode gain and C.M.R.R. ? **7**

6. a) Draw the block diagrams Voltage series and Current shunt negative feedback connections.

   b) Explain the operation of a transistor Astable multi vibrator. **(2+5)**

7. a) What are damped and undamped oscillations ?

   b) Explain with circuit diagram, the working of a Colpitt's oscillator. Write the expression for frequency of oscillations. **(2+5)**

8. a) Explain the working of Silicon Controlled Rectifier with a necessary diagram. Draw its VI characteristic curve.

   b) Draw the characteristics curves of a Photo transistor. **(5+2)**

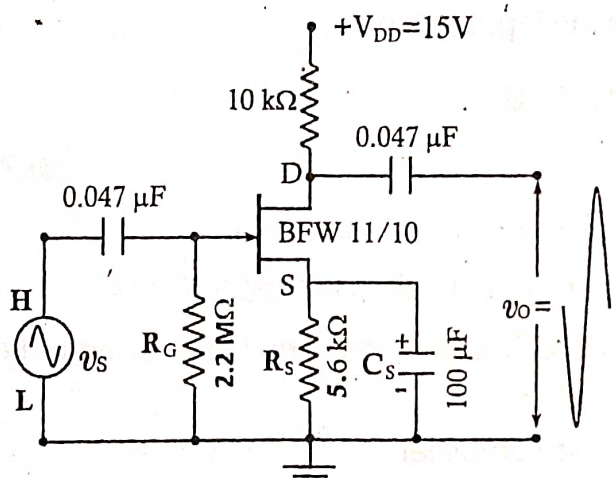
9. Explain the Working of N channel enhancement type MOSFET and draw its characteristic curves. 7

PART – C

Answer **any four** questions. **(4×5 = 20)**

10. A common emitter amplifier has an input resistance Ri = 2.5 kΩ and a voltage gain of 200 if the input signal voltage 5 m V, find a) the base current b) the collector current c) power gain and d) dB power gain. Take β = 50.

11. For common source amplifier shown, calculate the voltage gain. Given, g_m = 1 mS and r_d = 5 kΩ. What will be the voltage gain if the drain resistance is increased from 10 kΩ to 12 kΩ ?



12. In a dual input balanced output differential amplifier, I_E = 3 mA, R_C = 3 kΩ, R_E = 10 kΩ and β = 200. Calculate i) Differential gain ii) Common mode gain iii) Input impedance iv) CMRR

13. In a negative feedback amplifier A = 100 β = 0.04 and Vi = 50 mV. Find

    a) gain with feedback b) output voltage c) feedback voltage

14. In a transistor Hartley oscillator, L_1 = 30µH and $L_2 = 1 \times 10^{-8}$ H. The capacitance used in the tank circuit is 100 pF. Calculate the frequency of oscillations. Also calculate β.

15. A UJT has R_{B1} = 6.8 kΩ and R_{B2} = 3.2 kΩ. Find

    i) intrinsic stand-off ratio, ii) the Peak point voltage, if V_{BB} = 12 V and V_D = 0.65 V.