



J-0841
Second Year B. Sc. Examination
March / April – 2013
Electronics : Paper - III
(Electronic Circuits design and application)

Time : 3 Hours]

[Total Marks : 70

Instructions :

(1)

<p>नीचे दशांशवैल निशानीवाणी विगतो उत्तरवडी पर अवश्य कभवी. Fillup strictly the details of signs on your answer book.</p> <p>Name of the Examination : ☛ Second Year B. Sc.</p> <p>Name of the Subject : ☛ Electronics : Paper - III</p> <p>☛ Subject Code No. : 0 8 4 1 ☛ Section No. (1, 2,.....): Nil</p>	<p>Seat No. : <input type="text"/><input type="text"/><input type="text"/><input type="text"/><input type="text"/><input type="text"/><input type="text"/></p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; text-align: center; width: 100%;">Student's Signature</div>
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- (2) Figures to the right indicate full marks.
- (3) All symbols and abbreviations have their usual meaning.
- (4) Non-programmable calculators are allowed.
- (5) Q.1 is compulsory.
- (6) Assume data if necessary.

1 Write very short answers :

14

- (a) What is loop gain ? What are Barkhausen criteria of oscillation ?
- (b) Distinguish between amplifier and oscillator.
- (c) Why is voltage gain of an amplifier with negative feedback is smaller than no feedback ?
- (d) Explain 'transconductance' of FET.
- (e) What is the advantage of push pull operation of class-A amplifier circuit ?
- (f) Explain the parameter responsible for shift in operating point of BJT.
- (g) How a boot strap ramp generator circuit can be converted in to a free runing ramp generator ?

- 2 (a) Explain the principle, operation of FET with the help of circuit diagram and draw its characteristics curve. 7
- (b) Write note on common source amplifier. 7

OR

- 2 (a) Explain why Q-point is fixed at the centre region of active region of transistor characteristics for an amplifier. Derive the expression for stability factor in case of voltage divider bias circuit. 7
- (b) How we can get operating point stability with the help of bias compensation method ? Explain one of the compensation method in detail. 7
- 3 (a) Using a neat diagram of transistorised astable multivibrator explain its working principle and derive its necessary equation. 7
- (b) Calculate the component values of monostable vibrator developing an output pulse of 160 micro second. Assume $h_{fe(\min)}=20$, $I_{sat}=6$ mA, $V_{cc}=6$ V and $V_{BB}=1.5$ V. 7

OR

- 3 (a) State the advantage of negative feedback, show with necessary derivation the effect of negative feedback on bandwidth. 7
- (b) Define feedback network. Can we use active component a feedback network ? Give examples. 7
- 4 (a) Draw the circuit diagram of astable MV. Justify that it is two stage RC - coupled amplifier using feedback. How does it generate square wave ? 7
- (b) Conceder a astable MV 7
- (i) Determine the frequency of oscillaton if $R_1=R_2=20$ k Ω and $C_1=C_2=0.002$ μ F .
- (ii) Determine the value of capacitor to provide train of pulse of 10 microsecond wide at a repetition rate of 20 kHz, if $R_1=R_2=2$ k Ω .

OR

- 4 (a) Explain the working principle of R-C phase shift oscillator and derive its frequency of oscillation. **7**
- (b) A three section R-C phase shift oscillator has **7**
R=30 kohm and C=0.001 microfarad. What is the frequency of oscillation ?
- 5 Write short notes : (on any **two**) **14**
- (a) Transformer coupled amplifier
- (b) Triggering in multivibrator
- (c) Negative resistance oscillator
- (d) FET as VVR.
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