

B.E. Civil Engineering (Model Curriculum) Semester - V  
**PCC-CE505 - Survey-II**

P. Pages : 2

Time : Three Hours



**GUG/S/23/13728**

Max. Marks : 80

- Notes :
1. All questions carry equal marks.
  2. Due credit will be given to neatness and adequate dimensions.
  3. Assume suitable data wherever necessary.
  4. Diagrams and Chemical equation should be given wherever necessary.
  5. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Explain concept of Bernoulli's Lemniscate curve. 8
- b) Determine the offset to be set out at  $\frac{1}{2}$  chain interval along the tangents to locate a 16-chain curve, the length of each chain is 20 m. 8

**OR**

2. A road bend which deflects  $80^\circ$  is to be designed for a maximum speed of 100 km/hr. a maximum centrifugal ratio of  $\frac{1}{4}$  & a maximum rate to the change of acceleration of  $30 \text{ cm/sec}^3$ . The curve consisting of a circular arc combined with two cubic spirals. Calculate : 16
- i) The radius of circular curve
  - ii) The requisite length of transition
  - iii) The total length of the composite curve.
  - iv) The chainages of the beginning & end of transition curve and of the junctions of the transition curves with the circular arc if the chainage of the P.I. is 42862 m.
3. a) Explain purposes of field Astronomy and use of instruments in Astronomical Surveying. 10
- b) Define Astronomical terms. 6

**OR**

4. a) The apparent altitude of Alpha cruse at its upper transit was observed as  $23^\circ 22' 20'' \text{S}$ . What is the observers latitude ? If declination of Alpha cruse was  $52^\circ, 32', 20'' \text{S}$ . 8
- b) Determine the azimuth and altitude of a star from the following data : 8
- Latitude of the observer =  $48^\circ \text{N}$   
Hour angle of star =  $43^\circ$   
Declination of star =  $18^\circ 20' \text{N}$
5. a) Describe celestial sphere and Astronomical terms. 10
- b) Write a note on different time systems. 6

**OR**

6. a) Describe in detail correction to Apparent altitude. **10**  
 b) Explain the concept of motion of sun and stars. **6**
7. a) Explain the methods of locating soundings by observations with sextant method. **10**  
 b) Define tide and explain the concept of Lunar tide. **6**

**OR**

8. a) Find the time of afternoon high water at a place with following data : **10**  
 i) time of moon's transit on that day = 4h40m  
 ii) mean establishment = 3h10m  
 iii) age of tide = 2 days
- b) Write a note on : **6**  
 i) Spring tides ii) Neap tides.
9. a) Define : **10**  
 i) True value of a quantity  
 ii) Most probable value  
 and explain the laws of weights.
- b) Explain the general principles of least squares. **6**

**OR**

10. a) Find the most probable value of the angle A from the following observation equations : **8**  
 $A = 30^{\circ}28'40''$  wt. 2  
 $3A = 91^{\circ}25'55''$  wt. 3.
- b) Adjust the following angles closing the horizon : **8**  
 $A = 110^{\circ}20'48''$  wt. 4  
 $B = 92^{\circ}30'12''$  wt. 1  
 $C = 56^{\circ}12'00''$  wt. 2  
 $D = 100^{\circ}57'04''$  wt. 3

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