

17602

15116

3 Hours / 100 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data, if necessary.
- (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
- (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. a) Attempt any THREE of the following: **12**
- (i) State the importance of road transportation in overall development of a country.
- (ii) State the classification of road according to third road development plan.
- (iii) Define alignment of road. State any four factors controlling road alignment.
- (iv) What are main objectives of preliminary survey?
- (v) What is camber? State IRC values of camber for different roads.

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- b) **Attempt any ONE of the following:** **6**
- (i) Explain construction procedure of bituminous road.
 - (ii) Calculate the passing sight distance for a two way highway with one way traffic and having design speed 80 kmph. The rate of acceleration of fast moving vehicle is 4 kmph/sec and difference in speed between overtaking vehicle and slow moving vehicle is 20 kmph.
2. **Attempt any FOUR of the following:** **16**
- a) What is land acquisition plan and longitudinal section? Mention their use.
 - b) Draw typical c/s of road in cutting.
 - c) What is overtaking zones? Why it is provided on highway? How the length of overtaking zone is decided?
 - d) State the situations under which following gradients are provided:
 - (i) Limiting
 - (ii) Exceptional
 - (iii) Floating
 - (iv) Average
 - e) Draw a neat sketch of pavement. State the functions of each components.

- 3. Attempt any FOUR of the following:** **16**
- a) What is equilibrium superelevation? Determine the permissible speed on a curve having radius of 150 m with super elevation of 15% and coefficient of friction 0.6.
 - b) Estimate the extra widening required for a pavement of width 7 m (two lane) on a horizontal curve of radius 250 m. If the longest wheel base of vehicle excepted on a road is 8 m. Design speed is 60 kmph. IRC recommended value of extra widening is 0.6 m.
 - c) Draw the cross-section of a typical hill road and label the component parts.
 - d) Define soil stabilization; with necessity. Explain mechanical soil stabilization.
 - e) State the properties of joint sealer. Also state the joint sealer materials.
- 4. a) Attempt any THREE of the following:** **12**
- (i) Define the following terms:
 - 1) borrow pits
 - 2) spoil bank
 - 3) lead
 - 4) lift
 - (ii) State the information rendered by traffic volume study.
 - (iii) Draw the sketches of regulatory sign and warning sign (four each).
 - (iv) Define “Drainage”. State the types of drainage system. Draw the sketch showing the different ways through which water enter into structures.
- b) Attempt any ONE of the following:** **6**
- (i) During the construction of WBM road, what precautions are necessary for rolling and finishing?
 - (ii) State the sequential operations involved in construction of cement concrete road.

5. Attempt any FOUR of the following:**16**

- a) Draw the sketches of:
 - (i) Diamond types grade interchange
 - (ii) Rotary interchange
- b) Explain with neat sketch 'catch water drains'.
- c) Explain with sketch methods of providing super elevation.
- d) Prepare the schedules of maintenance operations required in period from June to April.
- e) State the uses of following equipments during construction of highway.
 - (i) Power shovels
 - (ii) Drag lines
 - (iii) Rippers
 - (iv) Scrappers
- f) Explain the working of hot bitumen plant.

6. Attempt any FOUR of the following:**16**

- a) Enlist types of compacting equipments.
 - b) Draw a neat sketch of dragline and label it.
 - c) What do you mean by land slides? State four preventive measures for land slides.
 - d) State the necessity of providing road drainage.
 - e) Draw a neat line sketch of JCB and label it.
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