Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E –IIst SEMESTER–EXAMINATION – JULY- 2012

Subject code: 1721903 **Date: 10/07/2012**

Subject Name: Highway Construction and Management

Time: 10:30 am – 13:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Which are the various surveys to be carried out for preparation of DPR for Highway Construction Projects? Explain Any two surveys.	**07**
	(b)	Enlist the road making machinery for the following activities. 1. Site Clearance and hauling, 2. Earth Spreading, 3. Rock Excavation 4. Aggregate Production, 5. Compaction.	**07**
Q.2	**(a)**	What do you understand by 'Macadam Construction'? Write specifications for materials used in WBM. Find quantities of coarse aggregate, screening type A (12.5mm) and binding material for sub-base having thickness of 100mm on 3.75m wide lane for 5km long road construction.	**07**
	(b)	Write note: Wet Mix Macadam construction and its uses in highway construction.	**07**
		OR	
	(b)	What is single surface dressing (SSD)? What are the functions of SSD? Explain step wise construction procedure for SSD.	**07**
Q.3	**(a)**	Differentiate between the following 1. Seal coat and Tack coat 2. Semi-grouting Macadam and Penetration Macadam	**07**
	(b)	1. Write note: quality Control Charts: CUSUM 2. List equipments for Quality Control in Flexible Pavement Construction.	**07**
		OR	
Q.3	**(a)**	Explain with schematic diagram the production of bituminous mix in hot mix plant Enlist Parameters for Quality Control of Hot Mix.	**07**
	(b)	Write Note: Mastic Asphalt Construction OR Stone Mastic Asphalt (SMA) Construction	**07**
Q.4	**(a)**	Write general steps in construction of Cement Concrete Pavements.	**07**
	(b)	What is PQC and DLC? Why DLC layer is provided in rigid pavement construction?	**07**
		OR	
Q.4	**(a)**	Which are the various joints provided in cement concrete pavement construction? Explain with sketches: Expansion Joints.	**07**
Q.4	**(b)**	Define the following terms: Activity, Event, Network, Duration, Earliest Start, Earliest Finish, Critical Path.	**07**

Q.5 **(a)** Which are the stages of construction project? Describe each stage. **07**

(b) Give Formats in Tabular form for construction schedule and Equipment Schedule. **07**

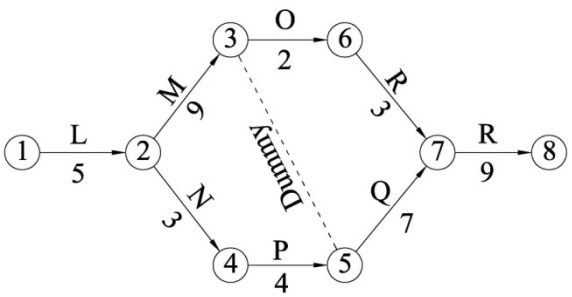
OR

Q.5 **(a)** The Highway relocation project includes the following quantities and activities. Prepare the construction schedule for the same. **07**

Length	= 13.6km
Width of right of way	= 33m
Clearing and Grubbing	= 30Ha
Drainage Structures	= 12Multibox Concrete Culverts, average Length 10m.
Earth fill in excess of cut from borrow pits with average haul distance of 1.2km	= 1,20,000 cum (Bank Measure Volume)
Concrete pavement	=7m wide having a thickness of 22.5cm

1. For clearing and grubbing bulldozers are required, the rate of working of bulldozers is 0.4Ha per Day.
2. For drainage structure assume that 3 culverts are under construction at the same time. Three weeks are required for each culvert. Construction of culvert should not be started until a sufficient portion of right of way is cleared.
3. Earth fill: One power shovel capacity 1.17 cum having output 117cum/hour.
   6 Nos. trucks of 4.5 cum capacity each required.
   Also one motor grader, one sheep foot roller, one truck mounted with water tank are required.
4. Pavement: One concrete mixer of one cum capacity and one power finisher is required.

(b) For the network given below, calculate floats and decide the critical path. **07**



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