



Important Instructions to examiners:

- 1) The answers should be examined by key words and not as word-to-word as given in the model answer scheme.
- 2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
- 3) The language errors such as grammatical, spelling errors should not be given more importance. (Not applicable for subject English and Communication Skills).
- 4) While assessing figures, examiner may give credit for principal components indicated in the figure. The figures drawn by candidate and model answer may vary. The examiner may give credit for any equivalent figure drawn.
- 5) Credits may be given step wise for numerical problems. In some cases, the assumed constant values may vary and there may be some difference in the candidate's answers and model answer.
- 6) In case of some questions credit may be given by judgment on part of examiner of relevant answer based on candidate's understanding.
- 7) For programming language papers, credit may be given to any other program based on equivalent concept.

Marks

1. a) Attempt any THREE of the following:			12
i) Give any four types of form used in MVA. State its purpose.			4
Answer: Types of forms used in MVA: (Any four types of forms – 1 mark each)			4
Sr.	Form	Use/Purpose	
1.	Form 1	Application cum declaration of physical fitness	
2.	Form 1 A	Medical certificate	
3.	Form 2	Application for the grant or renewal of learners license	
4.	Form 3	Learner's license	
5.	Form 4	Form of application for license to drive a motor vehicle	
6.	Form 5	Driving certificate issued by driving school or establishment	
7.	Form 6	Form of driving license (Ordinary type)	
8.	Form 7	Form of driving license (Smart Card type)	
9.	Form 8	Application for the addition of new class of vehicle to a driving license	
10.	Form 9	Form of application of renewal driving license	
11.	Form 10	Starter register of driving license	
12.	Form 11	Form of license for the establishment of new driving school	
13.	Form 12	Form of application to engage in the business of importing instructions in the driving of motor vehicle	
14.	Form 13	Form of application for renewing la license to engage in the business of importing instructions in the driving of motor vehicles	
15.	Form 14	Register showing the enrolment of the trainees in the driving school establishment.	
16.	Form 15	Register showing the driving hours spend in the a trainees	
17.	Form 16	Form of application a renewal of trade certificate	



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18.	Form 17	Form of trade certificate	
19.	Form 18	Intimation of loss or destruction of a trade certificate an application for duplicate	
20.	Form 19	Register to be maintained by the holder of trade certificate	
21.	Form 20	Form of application for registration of motor vehicles	
22.	Form 21	Sale certificate	
23.	Form 23	Form of certificate of registration	
<i>Note: Credit shall be given to any other appropriate form concerned in this regard.</i>			
ii) Write any four objective of taxation.			4
Answer: Objectives of taxation: <i>(Any four objectives – 1 mark each)</i> <ol style="list-style-type: none">1. Raising the revenue of government.2. Economical growth of state and nation.3. Reduction in unemployment.4. Reduction in regional disparities.5. Distributional justice to all the people.			4
iii) Which vehicles are exempted from permit?			4
Answer: Vehicles exempted from Permit: <i>(Any four – 1 mark each)</i> <ol style="list-style-type: none">1) Any transport Vehicles own by central or state government, & used for government purposes. It should not be connected with any commercial enterprise.2) Any transport vehicle used for government purpose by order.3) Any transport vehicle own by local authorities or by a person under contract with a local authority and used for purposes like road cleaning, road watering, and for construction of roads.4) Any transport vehicle solely used for police, fire brigade and medical purposes.5) Any transport vehicle used for towing breakdown vehicles or used for removing goods from breakdown vehicles to the place of safety.6) Any transport vehicle used for the purpose of any educational institutes which is recognized by state government or central government.7) Any transport vehicle used by a person who manufactures or deals in motor vehicles or builds bodies for attachment to the chassis and solely for the purpose in accordance with the condition in the act.8) Any goods vehicle whose gross vehicle weight does not exceed 300 Kg.9) Any transport vehicle used for the social purposes such as at the time of flood, earthquakes and for any natural calamities. .10) Any transport vehicle proceeding empty for registration.11) Any transport vehicle proceeding empty for major repairs12) Any transport vehicle which is subjected to hire purchase agreement and on default of the owner has taken possession by the person or any financial organization whose name is entered in such an agreement & that vehicle is made to reach its destination.			4



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iv) State the necessity of holding driving licence and age limit for all types of driving licences.

4

Answer: (*Necessity of driving licence – 01 marks & Age limit – 03 marks*)

Necessity of Driving Licence:

No person shall drive a motor vehicle in any public place unless he holds an effective driving license issued to him authorizing to drive the vehicle of particular class mentioned therein; and no person shall so drive a transport vehicle hired for his own use or rented under any scheme, unless his driving licence specifically entitles him to do so.

Driving a motor vehicle without a valid driving licence is an offence.

Age limit for driving license: (*Any Six – 1/2 mark each*)

Type of Licence	Age limit
Motor Cycle without gear	16 years
Motor Cycle with gear.	18 years
Invalid Carriage	18 years
Light Motor Vehicle Non Transport (Car, Three Wheeler, Tractor)	18 years
Light Motor Vehicle Transport (LMV, Three Wheeler)	18 years
Medium Goods Vehicle	18 years
Medium Passenger Motor Vehicle	20 years
Heavy Goods Vehicle	20 years
Heavy Passenger Motor Vehicle	20 years
Road Roller	20 years

3

b) Attempt any ONE of the following::

6

i) Define

- 1) Permit
- 2) Certificate of registration
- 3) Heavy motor vehicle
- 4) Goods vehicle
- 5) Conductor
- 6) Un-laden weight

6

Answer: (*Definition - 1 mark each*)

1) Permit: It means a document issued by a State or Regional Transport Authority or an authority prescribed in behalf under MVA authorizing the use of a motor vehicle as a transport vehicle.

2) Certificate of registration: It means the certificate issued by a competent authority to the effect that a motor vehicle has been duly registered in accordance with the provisions of Chapter IV of MVA.

3) Heavy motor vehicle: It means any goods carriage the gross vehicle weight of which, or a tractor or a road-roller the un-laden weight of either of which, exceeds 12,000 kilograms

OR

Any public service vehicle or private service vehicle or educational institution bus or omnibus the gross vehicle weight of any of which, or a motor car the un-laden weight of which, exceeds 12,000 kilograms

4) Goods vehicle: It means any motor vehicle constructed or adopted for use solely for the carriage of goods, or any motor vehicle not so constructed or adapted when used for the carriage of goods.

6



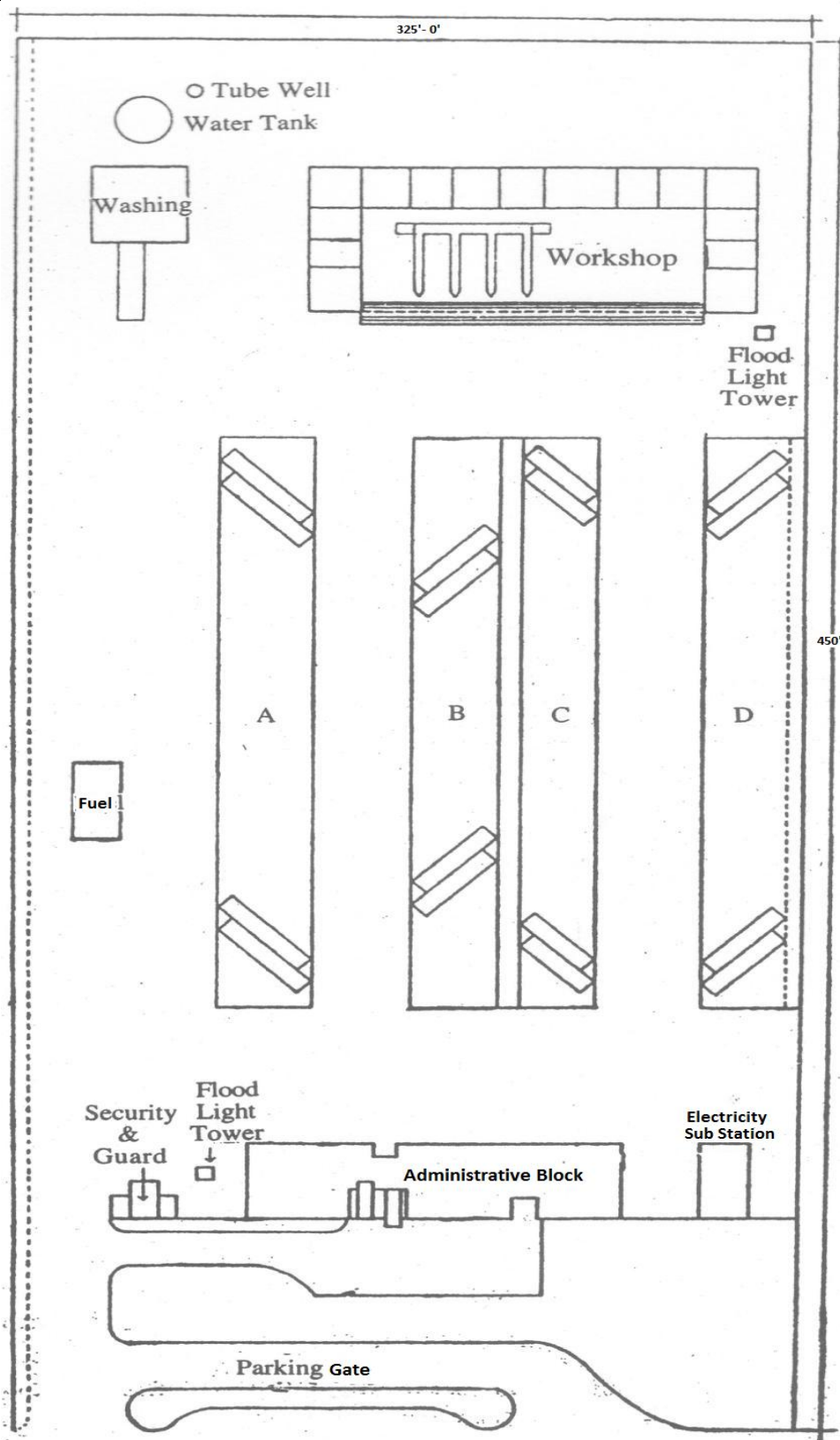
5) Conductor: In relation to a stage carriage, it means a person engaged in collecting fares from passengers, regulating their entrance into, or exit from, the stage carriage and performing such other functions as may be prescribed by the concerned authorities.	
6) Un-laden weight: The weight of a vehicle or trailer including all equipment ordinarily used with the vehicle or trailer when working, but excluding the weight of a driver or attendant; and where alternative parts or bodies are used, the un-laden weight of the vehicle means the weight of the vehicle with the heaviest such alternative part or body.	
ii) List the types of permit. Explain tourist permit.	6
Answer: (<i>Types of permit – 2 marks & Explanation of tourist permit – 04 marks</i>)	
Types of Permits: (<i>Any Four- ½ marks each</i>) 1. Stage carriage permit 2. Contract carriage permit 3. Private service vehicle permit 4. Goods carriage permit 5. National permit 6. All India Tourist permit	2
Tourist permit: <ul style="list-style-type: none">• The tourist permit is issued by the authority to vehicle which frequently operates on outside the home state. In this case temporary permit is not possible to obtain every time for a particular trip.• The applicant has to apply on form 45 & 48 along with other formalities.• This permit is given to luxury buses which have white colour with a blue ribbon of five centimeters width at the center of exterior of the body and the word 'Tourist' shall be inserted on two sides of the vehicle within a circle of sixty centimeters diameter.• A tourist permit shall be deemed to be invalid from the date on which the motor vehicle covered by the permit completes 9 years in the case of Motor Cab and 8 years where the motor vehicle is other than a motor cab, unless the motor vehicle is replaced by another, the latter vehicle shall not be more than 2 years old on the date of such replacement.• The seating layout shall be two and two or one and two or one and one on either side, all seats facing forwards.• The Vehicles should also have other facilities like public address system, drinking water, push full back seats, fans, curtains, a separate driver cabin etc.• Every motor vehicle or motor cab under the Authorization Certificate issued under these rules shall exhibit the words 'All India Tourist Permit' on the back of the motor vehicle in contrasting colours, so as to be clearly visible	4
2. Attempt any <u>FOUR</u> of the following:	16
a) Draw the general layout of vehicle bus depot.	4
Answer: (<i>Note: Credit should be given to equivalent layout</i>)	4



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General layout of vehicle bus depot



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b) Write steps involved in accident survey report.	4
<p>Answer: Steps involved in preparation of accident survey report:</p> <p>Whenever an accident occurs all particulars have to be collected for purpose of preparing a report known as accident survey report. While applying for insurance claim to insurance company when the vehicle is met to an accident or damaged due to any natural calamity, an Accident survey report is required to be attached with application form. It is prepared by the surveyor appointed by the insurance company.</p> <p>1) Whenever an accident occurs all particulars have to be collected and ascertained as given below-</p> <ul style="list-style-type: none">a) General: Site, date and time of accidentb) Registration no. of vehicle involved in accidentc) Nature of Accidents - Collision with or avoidance of overturning or any other kind of accident.d) Primary Cause of accident - Fault of driver or pedestrian, defective road surface, other cause, unknown.e) Light condition- Daylight, dusk, dark with good street light, dark with no street light.f) Road condition- Straight, bend, intersection, flat, dry, wet, hill, concrete, earth road.g) Traffic condition- Dense/light/moderate traffic, controlled junction, uncontrolled junction.h) Responsibility of driver- Sex, age, driving experience, intoxicated, asleep or inattentive, speeding.i) Responsibility of Pedestrian- Age, deaf, blind or otherwise walking on road, crossing or running into road, intoxicated, confused by traffic, talking in roadways.j) Particulars of motor vehicle- Age of vehicle, overload, and defective brakes, defective steering, puncture or burst, other serious mechanical defects.k) Casualties persons killed/ injured- Rider of motorcycle, passengers other than driver or rider, cyclist, pedestrian, not known. <p>2) Assess the quantum of loss.</p> <p>3) Determine the liability of the insurers within the framework of policy conditions.</p> <p>4) Negotiate with the insurer/advise the insurers regarding the disposal of salvage.</p> <p>5) Prepare the detail survey report and submit it to the insurer.</p>	4
c) Define- <ul style="list-style-type: none">i) Public Placeii) Vehicle scheduleiii) Tripiv) Route	4
<p>Answer: (Each Definition carries 1 mark)</p> <p>(i) Public place: It means a road, street, way or other place, whether a thoroughfare or not, to which the public have a right of access, and includes any place or stand at which passengers are picked up or set down by a stage carriage.</p> <p>(ii) Vehicle Schedule: The detailed plan of arrival and departure of buses to be operated by the depot is known as vehicle schedule.</p> <p>(iii) Trip: Journey between two stations i.e. from start of travel to the final destination for carrying passengers or goods on hire or reward is known as trip.</p> <p>(iv) Route: It means line of travel of the specific way in between two terminals on which the motor vehicle may be operated.</p>	4



<p>d) Draw traffic signs for – i) No parking ii) No entry sign</p>	4
<p>Answer: (Traffic signs – 2 marks each)</p> <p style="text-align: center;">(i) No parking:</p> <div style="text-align: center;">  </div> <p style="text-align: center;">(ii) No entry sign:</p> <div style="text-align: center;">  </div>	4
<p>e) State the role of automobile engineer in transport organization.</p>	4
<p>Answer: (Any four equivalent points – 1 mark each)</p> <p>Role of an Automobile engineer in transport organization: An Automobile Engineer is the real technocrat in automobile as well as transport industry, so he is required to play an important role as a responsible person as follows:</p> <ol style="list-style-type: none"> 1. Automobile engineers as an authority have to perform different functions in the office of STA/RTA as licensing authority, registration authority, Taxation authority etc. 2. In transport organizations, planning and scheduling various transport operations - Route Survey and trip planning, Scheduling of buses and Crews, 3. To maintain different records and its analysis. 4. Traffic analysis and control. 5. To adopt new technology and to introduce various improvement programs in new generation vehicle. 6. To try for different means of fuel economy. 7. To try to make vehicle more attractive, more comfortable and more reliable. 8. He is required to carry out the research and impart drivers training and road safety aspects. 	4
<p>f) What is the procedure for preparation of selling a used vehicle?</p>	4
<p>Answer:(Any equivalent four points – 1 mark each)</p> <p>Procedure for Preparation for selling an used vehicle:</p> <ol style="list-style-type: none"> 1. Give vehicle "Curb Appeal": When people come to buy car, they will probably make up their minds to buy it or not within the first few seconds. This is based on their first look at the car. So car should have "Curb Appeal". 2. Before you advertise your car for sale, make sure it looks clean and attractive: <ul style="list-style-type: none"> • Wash and vacuum the car. • Make sure that vehicle is free from abnormal sounds, dents, scratches. • If necessary, make low cost repair or replacement of parts. • Wipe the brake dust off the wheel covers and treat the tyres with a tyre gloss product. • Thoroughly clean the windows (inside and out) and all the mirrored surfaces. • Wipe down the dashboard and empty the ashtrays. • Keep all maintenance records ready to show prospective buyers. • If necessary, do the servicing. 	4



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3. Documentation: Following documents are required while selling the vehicle -

- Registration certificate
- Tax certificate
- Insurance certificate
- PUC certificate
- NOC certificate

4. Set your vehicle price: Keep the written estimate of repair on damage if any before selling.

5. Take a copy of service record from the dealer to assure that the vehicle is maintained properly.

6. Set the price of vehicle that will be best negotiable.

3. Attempt any FOUR of the following:

a) What is fare? What are different methods to calculate fare?

Answer:

Fare: It means the sum payable for a daily or seasonal ticket in respect of the hire of a Contract or Stage carriage. Fare is charged on the trip base or distance to be travelled.

There are two methods of charging the fare as – 1. Straight fare method 2. Telescopic fare method

1. Straight fare method: Straight fare method provides increasing rate of charge as the distance traveled increases. Suppose, the fare rate is Rs.1/- per kilometer then the fare for 5 kilometer may be Rupees 5/- and any journey within this 5 kilometers will be charged Rupees.5/- . This is known as minimum fare. The fare for 15 kilometers may be fixed as Rupees.15/-

2. Telescopic or Tapered scale method: Tapered scale of fare provides a decreasing rate of charge as the distance traveled increases. Normally in this fare method, the first few kilometers would have a straight line type of fare which would then progressively taper off. Suppose, the fare rate is Rs.1/- per kilometer then the fare for 5 kilometer may be Rupees 5/- and any journey within this 5 kilometers will be charged Rupees.5/- . This is known as minimum fare. After 5 kilometers the fare rate may decrease proportionately. For instance, the fare for 15 kilometers may be fixed as Rupees.13/- instead of Rupees.15/-

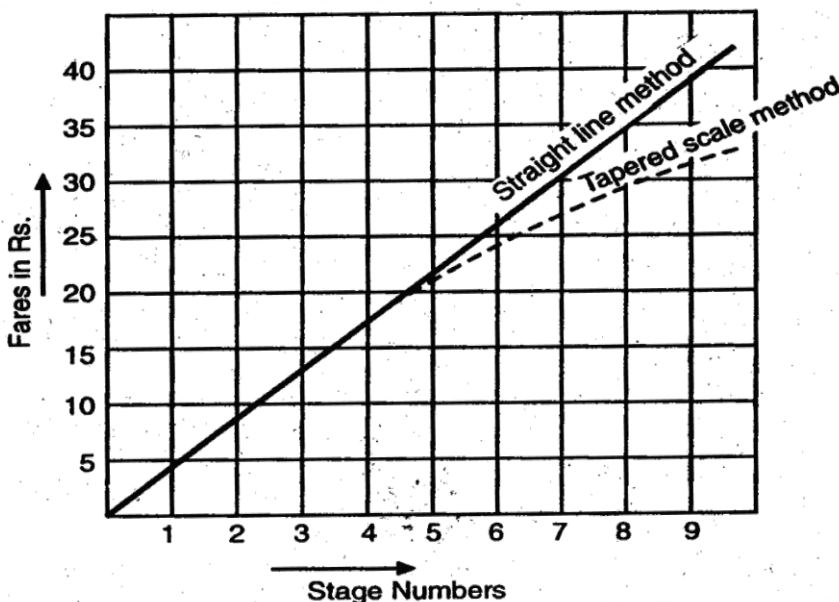


Fig. Straight fare and Telescopic fare method



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<p>b) List four topper automobile industries in India for-</p> <p>i) LMV ii) Two wheeler</p>	<p>4</p>
<p>Answer:</p> <p>LMV automobile industries in India(Any four- ½ mark each)</p> <ol style="list-style-type: none"> 1. Maruti Suzuki India Ltd. 2. Hyundai Motors India Ltd 3. Honda Siel Cars India Ltd 4. Ford India Private Ltd 5. Volkswagen Group India Private Limited 6. Tata Motors Ltd. 7. Mahindra & Mahindra Ltd. 8. General Motors IndiaPvt. Ltd 9. Force Motors Ltd <p>Two wheeler automobile industries in India(Any four- ½ mark each)</p> <ol style="list-style-type: none"> 1. Hero Motocorp Motors Ltd 2. Bajaj Auto Ltd. 3. Honda Motorcycle and Scooter India (Pvt.) Ltd 4. TVS Motor Company Ltd. 5. Royal Enfield Motors India Ltd 6. Yamaha Motors India Pvt. Ltd 7. Mahindra Two Wheelers 	<p>2</p> <p>2</p>
<p>c) Enlist the basic factors in crew scheduling.</p>	<p>4</p>
<p>Answer: Basic factors in Crew scheduling-</p> <ol style="list-style-type: none"> 1) Hours of work: As per the transport worker act, no adult motor transport worker shall be required or allowed to work for more than eight hours in any day and for forty eight hours in any week. 2) Daily and weekly intervals for rest: The hours of daily work should be fixed in such a that no transport worker is allowed or required to work for more than five hours at a stretch before he has a rest interval for at least half an hour. This does not apply to a motor transport worker who is not required to work for more than six hours on a particular day. 3) Spread over: The hours of work of a motor transport worker should not spread over more than twelve hours in any day. 4) Spell of duty: the hours of work of a motor transport worker should not be split into more than two spell on any day. 5) Overtime allowance: Where a transport worker works for more than eight hours in any day where he is required to work on any of rest, he is entitled to wages at a rate which is twice his ordinary rate of wages in respect of the overtime work or the work done on the day of rest. 6) Handing over and taking over time: Hour of work have been defined to include- <ol style="list-style-type: none"> (i) All the transport spent in work done during the running time of the transport vehicle. (ii) The time spent in subsidiary work and (iii) Periods of mere attendance at terminals, of less than fifteen minutes. 	<p>4</p>



d) Write full forms of VRDE, MSRTC, BEST and ARAI.	4
Answer: Full forms of VRDE, MSRTC, BEST and ARAI(<i>Each correct full form - 1 mark</i>) VRDE: Vehicle Research & Development Establishment MSRTC: Maharashtra State Road Transport Corporation BEST: The Brihanmumbai Electric Supply & Transport ARAI: Automotive Research Association of India	4
e) What are the causes for transfer of ownership of motor vehicle?	4
Answer: Causes for transfer of ownership of motor vehicle are (<i>Each cause -1 mark</i>) 1. On death of owner of the vehicle, 2. On sell/purchase of the vehicle, 3. If the vehicle is purchased in public auction, 4. Registration of the vehicle in the name of financier on default of registered owner.	4
f) Write the general provision regarding construction and maintenance of motor vehicle.	4
Answer: General provisions regarding construction and maintenance of motor vehicle: (<i>Any 4 points, each point - 1 mark</i>) The Central government may make rules regulating the construction, equipment and maintenance of motor vehicles and trailers to all or any of the following matters namely, i) The width, height, length and overhang of vehicles and of the load carried, ii) The size, nature and condition of tyres, iii) Brakes and steering gear, iv) Signaling appliances, lamps and reflectors v) Speed governors vi) The emission of smoke, visible vapours, sparks, ashes, girt or oil, vii) The reduction of noise caused by vehicles, viii) The embossment of chassis number and engine number and the date of manufacturing. ix) Safety belts, handle bars of motor cycles, auto-dippers and other equipment essential for safety of driver, passengers and other road users x) Standards of the components used in the vehicle as inbuilt safety devices xi) Provision of transportation of goods of dangerous or hazardous nature to human life xii) Standard for emission of air pollutants.	4
4. a) Attempt any <u>THREE</u> of the following:	12
i) Write the functions carried out in CIRT.	4
Answer: Functions carried out in CIRT: (<i>Any four</i>) 1. To promote and provide for the study of the principles and practices of organization and management in various spheres of public transport. 2. To conduct research on critical issues in transport development and to undertake consultancy assignments to improve organizational effectiveness and operational efficiency. 3. To impart training and education to all categories of managers and professionals engaged in furthering the cause of public transport. 4. To help the government and its agencies in evolving integrating policies and legislative framework to enable a balanced growth of the transport sector.	4



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5.	To be the clearing house of ideas, information and data pertaining to transport industry with specific reference to satisfy, environment and productivity.	
6.	To lay down standards, specifications and norms for various materials used in heavy vehicles through performance evaluation, material analysis and quality monitoring.	
7.	To undertake research for improvement and technological up gradation of vehicles used for passenger transportation together with their components and assemblies.	

ii) Compare third party motor vehicle insurance and comprehensive motor vehicle insurance. 4

Answer: Comparison of third party motor vehicle insurance and comprehensive motor vehicle insurance: (Any four points)

Sr.	Third party motor vehicle insurance	Comprehensive motor vehicle insurance	
1	It means the person or property other than the vehicle and vehicle owner are safeguarded under this insurance.	It covers the risk of vehicle and its owner or driver as well as third party which involves in accident.	4
2	The policy does not provide any benefit to the insured; however it covers the insured's legal liability for death/disability of third party loss or damage to third party property.	Fire and theft cover is also provided against damage to the insured's vehicle.	
3	Personal injuries and personal vehicle damages will not be covered by this policy.	It does not include mechanical breakdown.	
4	For two wheelers, we can take this policy for life time. For other vehicles this policy has to be renewed annually.	It is required to renew the policy annually, and it can be renewed two months in advance.	
5	The cost is less than comprehensive motor vehicle insurance	The cost is more than third party motor vehicle insurance	

iii) Explain in brief global positioning system. 4

Answer: Global positioning system:

The Global Positioning System (GPS) is a satellite-based navigation system made up of a network of satellites placed into orbit. The GPS is owned and operated by the U.S. Department of Defense but is available for general use around the world. GPS works in any weather conditions, anywhere in the world, 24 hours a day. GPS receivers can be used in cars to relate the driver's location with traffic and weather information.

Working of GPS

1. 21 GPS satellites and three spare satellites are in orbit at 10,600 miles above the Earth. The satellites are spaced so that from any point on earth, four satellites will be above the horizon.
2. Each satellite contains a computer, an atomic clock, and a radio. With an understanding of its own orbit and the clock, it continually broadcasts its changing position and time. (Once a day, each satellite checks its own sense of time and position with a ground station and makes any minor correction.)
3. On the ground, any GPS receiver contains a computer that "triangulates" its own position by getting bearings from three of the four satellites. The result is provided in the form of a geographic position - longitude and latitude - to, for most receivers, within 100 meters.
4. If the receiver is also equipped with a display screen that shows a map, the position can be shown on the map.



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5. If a fourth satellite can be received, the receiver/computer can figure out the altitude as well as the geographic position. 6. If you are moving, your receiver may also be able to calculate your speed and direction of travel and give you estimated times of arrival to specified destinations.	
iv) What are the basic elements in transport management?	4
Answer: Basic elements of transport Management: (Any four elements -1 mark for each element) 1. Market potential: Type of goods/ passengers, Period of use, Probable competition. 2. Selection of vehicle: Type of load, Class of passenger, Type of service. 3. Organization setup: Govt., Semi Govt., Private. 4. Legal compliance: Documents required as per MVA, Registration. 5. Policies of transport organization: Policies towards passengers and employees.	4
b) Attempt any ONE of the following:	6
i) List factors to be considered while buying a new vehicle.	6
Answer: Factors to be considered while buying a new vehicle.(Any 6 points -1 mark each) 1. Features and quality of new vehicle: Checkout the features offered and additional optional fittings, which suits your lifestyle. Checkout the quality factors of new vehicle like mileage, fuel storage capacity, option of using alternative fuels like CNG/LPG, also safety features like airbags, antilock braking system etc. 2. Ex-showroom price and on road price: There is huge difference between on-road price and ex-showroom price. Ex-showroom price is the basic price which does not include Insurance, RTO registration charges, extended warranty if any and sometimes the Municipality Road tax etc. After adding all these you will get on road price. 3. Use of vehicle: Select the vehicle on basis of for what purpose you are buying a new vehicle (Personal use, Commercial use, expected seating capacity etc.) 4. Inspecting the vehicle: Before purchasing the vehicle inspect the vehicle for whether the features are as per your demands or not. 5. Gather expert reviews: Read expert comments and reviews on the vehicle, you are buying. Do the comparative study with other same class of vehicles to checkout for added benefits. Enquire about extended warranty as well as regular service contract. 6. Test drive the vehicle: Analyze and be sure that the vehicle has characteristics that you are looking for. Inspect and feel carefully all the interior and exterior such as bonnet, of vehicle. Checkout your vehicle thoroughly including braking, electrical, steering system etc before driving at home. 7. When and where to buy: Vehicles prices hike up and down often, Ex- Showroom price & tax applicable can also varied as per location hence it's important to decide when and where to buy a vehicle. 8. Closing the deal: Vehicles prices hike up and down often, so negotiate the price of the vehicle. Remember the Actual price of the car may be far less than the Advertised price so bargain as much as possible.	6



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b) What are the various facilities available at VRD? State functions and role of VRDE.	6
Answer: Facilities available at the VRDE: (Any three) 1. Material engineering Facility: It is capable of all type of processing treatment and testing of material, most types of fabrication and prototyping and limited quantity of production. Facility consists of foundry shop, heat treatment shop, machine shop, fabrication shop and material testing lab. 2. I. C. Engine laboratory: For testing of engines of wheeled and light tracked vehicle and to study all parameters at various conditions and endurance. 3. National Centre of Automotive Testing (NCAT): Special test tracks and instruments for on road vehicle testing, e.g. High speed track, Straight Track, Noise Track ,ABS track, pothole track, corrugated pave track , chassis twisted track, dust tunnel, gradient track, steering pad, wade through track etc. 4. Emission Laboratory: Emission test system for two/four wheeler, multi cylinder petrol and diesel engines.	3
Functions and role of VRDE: (Any three) 1. Its primary function is to help the defense and automotive industry regarding design, development, testing and certification of vehicle components. 2. To evaluate requirements of defense services as well as automotive industry. 3. The National Centre for Automotive Testing (NCAT), a separate division of VRDE, provides one stop solution to all vehicles testing (Laboratory as well as Road testing). 4. Development of specialist vehicles and systems for various roles including road mobile launchers and support vehicles for strategic missile programmes 5. Development of engines for unmanned aerial vehicles. 6. Development of light battle tank and systems for various combat roles. 7. Development of armoured wheeled vehicles and variants for various roles. 8. Development of systems and unmanned vehicles for nuclear, biological and chemical recycle and after-treatment. 9. Development of light unmanned aerial vehicles for low intensity conflict operations. 10. Development of multi feed gasification with poly generation technology. 11. Testing of military and commercial vehicles and engines for design validation and performance evaluation including emission tests.	3
5. Attempt any FOUR of the following:	16
a) Write organization structure of MSRTC.	4
Answer: Organization structure of MSRTC: The Maharashtra State Road Transport Corporation was established by State Government of Maharashtra as per the provision in Section 3 of RTC Act 1950. It employs three tire systems for maintaining buses as Central Workshop, Divisional Workshop and Depots. Central Workshops are at Aurangabad, Mumbai, Pune, Ahmednagar and Nashik. MSRTC is headed by the Chairman. Vice chairman and Managing Director assist the Chairman. General Managers of departments like Mechanical, Store and Purchase, Appeal, Personnel, Labour, Traffic, assist to Vice chairman and Managing Director. Also, Chief Engineer Production, Chief Statistician, Chief Civil Engineer, Secretary, Public Relation Officer, Chief Account Officer, Chief Vigilance Officer assist the Vice chairman and Managing Director.	4



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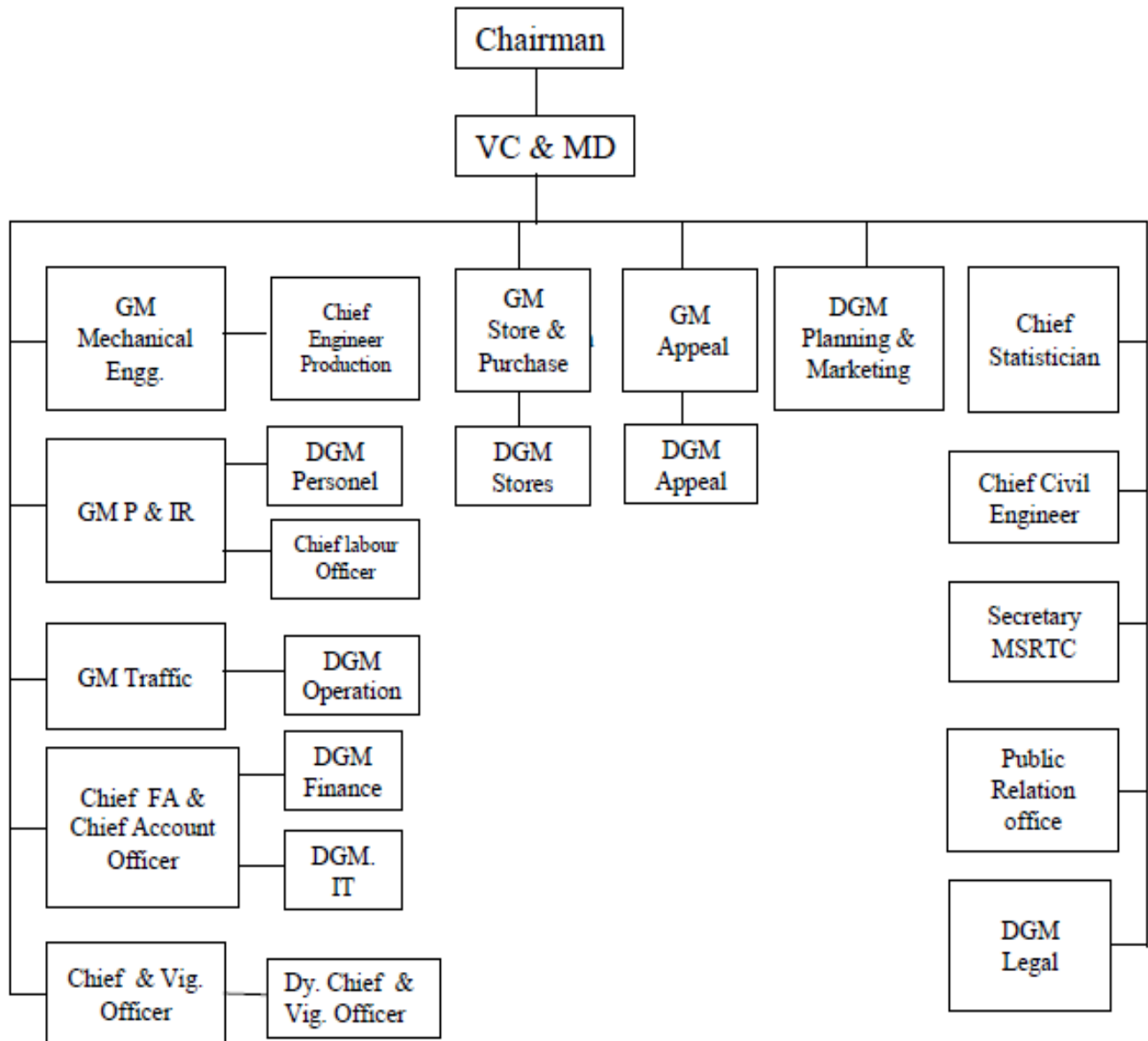
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Deputy General Manager of stores assists to the General Manager of Stores and Purchase. Deputy General Manager of Appeal assists to the General Manager of Appeal. Deputy General Manager of Personnel and Chief Labour Officer assists to the General Manager of Personnel. Deputy General Manager of Operation assist to the General Manager of Traffic, Deputy General Manager of Finance and IT assist to the Chief Account Officer. Deputy Chief and Vigilance Officer reports to the Chief Vigilance Officer.

The Depot Managers are heading each Depot. Traffic Superintendents/ Asst. Traffic Superintendents, Sr. Traffic Officers, Traffic Officers, Assistant Traffic Officers assist the Depot Managers. This team of officers directly controls the operational and administrative activities of the respective Depot.

OR





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b) State various types of booking used in transport management.	4
Answer: Following types of booking used in transport management. 1. To Pay at Destination: In this type of booking the party has to pay the cash and take delivery. 2. Paid: In this type, party to pay the freight charges in advance. 3. Billing: In this type, party has to pay the charges on submission of bills. There are five copies of a goods consignment notes for consignee copy, consigner copy, driver's copy, head office copy for accounts and office copy. 4. Online Payment: Payment through Internet banking in advance or after the delivery of consignment	4
c) What is certificate of fitness and its validity.	4
Answer: Certificate of fitness: It is the document in the prescribed form, showing that vehicle is mechanically fit and comply with all the specifications and requirements of motor vehicle act. If the vehicle to be used for commercial operation the vehicle is inspected physically by Transport Authority on regular basis for its road worthiness. The Certificate of Fitness is issued in Form 38. This certificate while remains effective, be valid throughout India.	2
Validity of fitness certificate: Newly registered transport vehicles certificate is valid for first two years and then it has to be renewed every year after inspection of vehicle by the concerned RTO. The fitness certificate for motor cars and motorcycles is valid for 15 years and then renewed for next 5 years.	2
d) Explain any four basic factors in bus scheduling.	4
Answer: Basic factors in bus scheduling-(Any four) 1) Traffic demand: Assessing the volume or traffic demand is essential in bus scheduling. Traffic survey should reveal traffic movement sector wise density, centripetal and centrifugal flow, peak and lean periods, competition from other modes of transport. Road survey helps to judge the feasibility of road operation. Route length, route condition, traffic points running time, fixation of bus stop. 2) Run time: It is the time taken by a bus on a particular route. Depending upon the time taken for one trip, number of buses running on that route and their frequency can be decided. 3) Stand time: It is called as layover time. It consist of time taken by passengers, to get in or get down the bus, to load or unload their luggage, time taken by the conductor to report to the controller, to give tickets to the passengers, cleaning of the bus etc. 4) Maintenance time: It is time taken for the preventive maintenance of vehicle. It includes routine daily checks and greasing, washing, cleaning, topping up diesel etc. 5) Vehicle Utilization: It is used to indicate the number of kilometers operated per vehicle per day. 6) Requirement of buses: Calculate the number of buses required to be operated considering frequency of service for a maximum utilization of a bus. $\text{No. of Vehicles} = \frac{\text{Running time(Twice)} + \text{Stand Time(Twice)}}{\text{Frequency of Service}}$	4



e) Describe the procedure of survey and valuation of vehicle.	4
<p>Answer: Procedure of Survey:</p> <p>It is mandatory for a person intending to act as a surveyor to obtain a license from the controller of insurance, ministry of finance, Govt. of India.</p> <p>Whenever an accident occurs all particulars have to be collected for purpose of preparing a accident survey report as below-</p> <ol style="list-style-type: none">1) General: Site, date and time of accident2) Registration no. of vehicle involved in accident3) Nature of Accidents4) Primary Cause of accident5) Light condition6) Road and traffic condition7) Responsibility of driver8) Responsibility of Pedestrian9) particulars of motor vehicle10) Result of investigation and court proceedings. <p>Procedure of Valuation:</p> <p>The process of determining the current worth of a vehicle is called as valuation. There are many techniques that can be used to determine value, such as subjective and objective</p> <ol style="list-style-type: none">1) Know the current market value of vehicle2) Calculate the depreciation of vehicle based on market value. for this consider –<ol style="list-style-type: none">i) Make, Model and Variant e.g. Maruti Swift VDiii) Month and Year of Manufacture e.g. July 2009iii) The city in which the car was registered.3) Calculate the depreciation of vehicle based on usage and aging.4) Analyze the mechanical condition and damage occurred with respect to Body, Chassis, and Aesthetics, Engine condition, vibrations, noise etc.5) Consider the Tyre condition and decide tyre cost.	2
f) State the benefits of smart cards in transport management.	4
<p>Answer: Following are the benefits smart card: (Any 04 - 01 mark each)</p> <ol style="list-style-type: none">1. The Smart-card driving license is electronically issued driving license.2. The Smart-card driving license is Tamper-proof.3. The Smart-card driving license is of a plastic card embedded with a microprocessor chip having 64KB memory.4. All details about the driving license holder (photograph, thumb impression, signature) are recorded on the computerized database and chip.5. One of the major benefits of Smart-card driving license is cutting down of time required in issuing a driving license.6. The applicants visiting the RTO office with forms and documents may get the new driving license on the same day.7. Driving license database is created and different reports are available.8. Easy to carry in pocket.9. Smart card is durable.	4



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6. Attempt any <u>FOUR</u> of the following:	16
a) Explain in brief BEST organization	4
Answer: BEST organization: <p>The Brihanmumbai Electricity Supply and Transport (BEST) Undertaking is the civic transport and electricity provider public body based in Mumbai, India. Since 1926, the BEST has been an operator of motor buses. In 1947, the BEST became an undertaking of the Bombay Municipal Corporation. It now operates as an autonomous body under the Municipal Corporation.</p> <p>The Undertaking operates one of India's largest fleets of buses. The bus transport service covers the entire city and also extends its operations outside city limits into neighboring Navi Mumbai, Thane and Mira-Bhayandar. In addition to buses, it also operates a ferry service in the northern reaches of the city. The electricity division of the organization is also one of the few electricity departments in India to garner an annual gross profit.</p> <p>The Transport Division is headed by Deputy General Manager-Transport, and he is assisted by Chief Manager -Traffic. BEST's entire operation is divided into 27 depots, and all these depots are placed in zones. Each depot is provided with a wireless vehicle, which is used to monitor the operation of buses in the jurisdiction of the depot.</p> <p>At present the BEST runs a total of 4,680 buses, ferrying 5 million passengers over 365 routes, and has a workforce strength of 38,000, which includes 22,000 bus drivers and conductors. Single decker buses make up the bulk of the fleet, followed by the double-decker buses which ply on selected routes. Also, the company launched limited 'disabled friendly' buses on exclusive routes in 2005 that have low ramps and space for wheelchairs. The company also plies vestibule buses on the city's two highways. All buses are tagged with a route number and its corresponding destination.</p> <p>BEST has introduced AC buses on certain routes, cashless smart cards for automatic fare collection, two LCD TVs per bus, an audio-visual surveillance system (CCTV) on each of its buses to monitor suspicious behaviour. BEST currently has over 1500 environmentally friendly Compressed Natural Gas (CNG) buses on its fleet.</p>	4
b) Explain – i) Vehicle ledger ii) Truck history card	4
Answer: Vehicle Ledger: <p>The data obtained from Trip Operational Sheet (TOS) is posted in a ledger called a vehicle ledger. The trip is indicated by a trip number which is also a T.O.S No. Additional columns are provided for gross profit before vehicle tax, depreciation and tyre cost. The balance of cash available is given in last column. Thus the vehicle ledger is collective record of the trips exposing the financial aspect of transportation.</p>	2
Truck History Card: <p>The performance of truck is evaluated from the truck history card this card gives detailed information about the mileage, tax paid, no. of repairs etc. Thus, the truck history card helps in deciding whether scrap the truck or not.</p>	2



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c) Write suspension or cancellation of driving licence in certain cases.	4
Answer: Suspension or cancellation of driving licence in certain cases. The driving licence may be suspended or cancelled if the holder of licence <ol style="list-style-type: none">1. Is habitual criminal or habitual drunkard2. Is required or committed a certain offence3. If the conduct of driver is likely cause danger to the general public4. If he is theft of the motor vehicle or theft of goods carried in goods carriage5. If he transports goods prohibited under any law6. Carries overload in goods carriage7. Driving with excessive speed8. Misbehavior with authority9. Carrying person in goods carriage10. Failed to stop when signal to do so by any person authorized to do so11. Smoking while driving public service vehicle.	4
d) State the passenger amenities and infra-structural facilities required.	4
Answer: Following amenities and infrastructural facilities are to be provided in a depot: (Any 8 points- each point carry ½ Mark) <ol style="list-style-type: none">1. Internal parking and External parking Regularly in-service buses stored in the interior of the garage, with less used or older service vehicles, and vehicles awaiting disposal are stored externally2. Fueling point3. Fuel storage tanks4. Engineering section - Smaller depot garages may contain the minimum engineering facilities, limited to light servicing facilities5. Inspection pits6. Bus washing bay7. Brake test lane8. Staff canteen/rest room9. Several bus depots are supplemented by a central works facility10. Garages may also contain recovery vehicles to recover break-downs vehicles11. Overhead tank for adequate water supply12. Adequate Electricity facility13. Central Store	4
e) Give the checklist for buying a used vehicle.	4
Answer: Checklist for buying a used vehicle: (Any 8 points- each carry ½ mark) <ol style="list-style-type: none">1. Tyres: the condition of tyres its life and nature of wear must be noted.2. Body: The condition of the body and paint must be checked.3. Battery: The condition of battery is also essential before valuation because its cost is also high.4. Rattling noise: Check noise level and its origin or source.5. Engine: Starting qualities, good pick up, low fuel combustion, power output must be checked on road test. Check also engine oil pressure. Exhaust smoke will also indicate the condition of cylinder and working parts.	4



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<p>6. Running Condition: On the road test it is possible to know drive the mechanism such as clutch, gear box, universal joint, differential. The wear and tear can be seen on road test.</p> <p>7. Registration and Tax payment: The vehicle R.C. book must be checked. This will indicate the model and year of manufacture and number of owners; the tax paid to the insurance, expiry date can also be seen.</p> <p>8. Make and Model, Year: This can be seen from R.C. book but with experience it is possible to indicate the number of years of service of vehicle.</p> <p>9. Number of Owners: From R.C. book it is possible to know the number of owners and type of persons who owned.</p> <p>10. Popularity of the make depending upon the public opinion market rates of the vehicles goes up and down.</p>	
<p>f) State the elements considered for site selection for a bus depot.</p>	4
<p>Answer: Elements considered for site selection for a bus depot: (Any four- 1 mark each)</p> <ol style="list-style-type: none">1. To reduce the dead Km bus Depot should be nearer to the bus station.2. It should not be much away from city, town, or village.3. It should have facilities like water, electricity, telephone, post office etc.4. It should be free from fear of flood, water logging.5. HT lines should not pass over the site.6. Communication facilities should be within reach.7. It is necessary to know the condition of soil because foundation cost increases in case of bad soil.8. Availability of sufficient land.9. If the site is near National Highway, it should be away by 100 feet from the Highway.	4