| Q M4 B1 |
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| (a)Solve the game whose payoff matrix is given by   | 1 | 7 | 2 | | --- | --- | --- | | 6 | 2 | 7 | | 5 | 1 | 6 |   OR  (b) A customer arrives at a one window drive in a bank according to Poission distribution with mean 10 per hour. Service time per customer is exponential with mean 5 minutes. The space in front of the window, including that for the serviced car can accommodate a maximum of three cars. Other cars wait outside this space. (i)What is the probability that the arriving customer can drive directly to the space in front of the window? (ii) What is the probability that the arriving customer will have to wait outside the indicated space? (iii) How long is an arriving customer expected to wait before starting service. |

| Q M4 B2 |
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| 1. Solve the game   Player B  Player A   | 6 | -3 | 7 | | --- | --- | --- | | -3 | 0 | 4 |     OR    (b)The belt snapping for convoeyers in open cast mine occur at a rate of 2 per shift. There is only one hot plate available for vulcanising and it can vulcanise on an average 5 belts snap per shift.  (i) What is the probability that when a belt snaps, the hot plate is readily available? (ii) What is the average number in the system? (iii) What is the waiting time of an arrival? (iv) What is the average waiting time plus vulcanising time? |

| Q M4 B3 |
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| Player B   1. Solve Player A  | 2 | -4 | 6 | -3 | 5 | | --- | --- | --- | --- | --- | | -3 | 4 | -4 | 1 | 0 |     OR  (b)In a railway marshalling yard, goods trains arrive at a rate of 30 trains per day. Service time on an average is 36 minutes. Calculate the following. (i) Average length of non-empty queue. (ii) The probability that the queue size exceeds 10. (iii) Average waiting time? |

| Q M4 B4 |
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| (a)Solve the following game problem  Player B  Player A   | -6 | 7 | | --- | --- | | 4 | -5 | | 1 | -2 | | 2 | 5 | | 7 | -6 |     OR  (b)A repair shop attended by a single mechanic has an average of four customers an hour who bring small appliances. The mechanic inspects them for defects and quite often can fix them right away or otherwise render a diagnosis. This takes him six minutes, on the average. You are required to (a) Find the probability that the shop is empty (b) Find the probability of finding at least one customer in the shop (c) What is the average number of customers in the system? (d) Find the average time spent, including service. |

| Q M4 B5 |
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| 1. Solve the game   Player A Player B   | 6 | 3 | -1 | 0 | -3 | | --- | --- | --- | --- | --- | | 3 | 2 | -4 | 2 | -1 |     OR  (b)Explain characteristics of the queuing system. |