M.Sc. CHEMISTRY Third Semester PHYSICAL CHEMISTRY-III (MSC - 303)

Duration: 20 minutes

Marks - 20

(PART A - Objective Type)

I. Choose the correct answer:

 $1 \times 20 = 20$

- 1. The electrocapillary maximum is defined as -
 - (a) Potential of zero charge
 - (b) Potential at which surface tension is maximum
 - (c) Summit of the γ vs V curve (parabola)
 - (d) All above
- 2. "The constant capacity with change of potential is a weakness of parallel-plate model", which theory overcame this weakness?
 - (a) Helmholtz-Perrin Theory
 - (b) Gouy-Chapman Theory
 - (c) Stern Theory
 - (d) Devanathan Theory
- 3. In Linear polarization resistance (LPR) technique for measuring corrosion monitoring, the probe used is
 - (a) mechanical probe
 - (b) electrical probe
 - (c) electrochemical probe
 - (d) microbial probe
- 4. Under low field approximation of Butler-Volmer equation, current density varies -
 - (a) Exponentially with overpotential
 - (b) Linearly with overpotential
 - (c) Quadratically with overpotential
 - (d) None above
- 5. In polarography DME acts as -
 - (a) Reference electrode
- (b) Working electrode
- (c) Counter electrode
- (d) None of the above
- 6. In polarography, if 'm' is the mass of the mercury drop and 't' is the drop time, the diffusion current proportional to
 - (a) $m^{2/3}t^{1/3}$

(b) $m^{3/2}t^{1/3}$

(c) $m^{2/3}t^{1/6}$

(d) $m^{3/2}t^{1/6}$

| (a) production(b) ATP is the(c) no ATP in | on of Anermodis prod | TP is exergo ynamically unced in TCA | ınstabl | | etica | ılly stable | | | |
|---|---|--|---|--|---|---|--|---|---|
| Main energy supply during musc (a) ATP (c) creatine phosphate | | | cle contraction happens from (b) Phospho-enol pyruvate (d) GTP | | | | | | |
| (a) NAD^+-NA | ADH | | | (b) ATP | -AD |)P | | | |
| . During glyco (a) 6 | olysis r (b) 2 | number of Al | TP mole(c) 3 | ecule pro | duc | ed is (d) 1 | | | |
| | | | | | | | | | |
| (a) Low $S_1 \rightarrow S_2$ energy gap | | | (b) High $S_1 \rightarrow T_1$ energy gap | | | | | | |
| 3. Eosin shows- (a) Excimer (c) E-type delayed fluorescence | | | (b) P-type delayed fluorescence (d) Both (i) and (ii) | | | | | | |
| 14. Norrish type I cleavage is-(a) α-cleavage(c) γ-cleavage | | | (b) β-cleavage(d) None of these | | | | | | |
| (a) Low $S_0 \rightarrow$ | S_1 gap, | | (b) Hi | _ | _ | _ | | | |
| (a) endotherm | nic, | | | (b) exoth | nerm | nic, | | | |
| Critical Forst (a) 0.40 | | | | | e wł | nere energ (d) 1.00 | y trans | fer effici | iency is- |
| The rate cons (a) Br | tant for (b) I | fluorescence | e is the (c) Cl | lowest fo | or- | (d) F | | | · · · · · · · · · · · · · · · · · · · |
| | | rea is- (b) 2.69×10 ¹ | 10 | of ozone | laye | er that con | sist of 1 | number (| ozone |
| | (a) production (b) ATP is the constant of the main energy (a) ATP (c) creatine puring glycom (a) $1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 $ | (a) production of A (b) ATP is thermod (c) no ATP is production (d) all statements and Main energy supply (a) ATP (c) creatine phosphate The main energy cy (a) NAD+NADH (c) Creatine-Creating During glycolysis in (a) 6 (b) 2 The electronic trans (a) $\sigma \rightarrow \sigma^*$ (b) π^- Intersystem crossin (a) Low $S_1 \rightarrow S_2$ energing (c) Low $S_1 \rightarrow T_1$ energy Easing shows (a) Excimer (c) E-type delayed for the state of | (b) ATP is thermodynamically u (c) no ATP is produced in TCA (d) all statements are correct Main energy supply during muse (a) ATP (c) creatine phosphate The main energy cycle in biolog (a) NAD ⁺ -NADH (c) Creatine-Creatine phosphate During glycolysis number of AT (a) 6 (b) 2 The electronic transition corresp (a) σ→σ* (b) π→π* Intersystem crossing is favoured (a) Low S ₁ →S ₂ energy gap (c) Low S ₁ →T ₁ energy gap Eosin shows- (a) Excimer (c) E-type delayed fluorescence Norrish type I cleavage is- (a) α-cleavage (c) γ-cleavage (c) γ-cleavage (c) Low S ₁ →T ₁ gap, For chemiluminescence, the cher (a) endothermic, (c) product is in the excited state Critical Forster distance is define (a) 0.40 (b) 0.50 The rate constant for fluorescence (a) Br (b) I One Dobson unit (DU) is the thic molecules per unit area is- (a) 2.69×10 ¹⁶ (b) 2.69×10 ¹⁰ | (a) production of ATP is exergonic profeb ATP is thermodynamically unstable (c) no ATP is produced in TCA cycle (d) all statements are correct Main energy supply during muscle com (a) ATP (b) Pt (c) creatine phosphate (d) G. The main energy cycle in biological sys (a) NAD+NADH (c) Creatine-Creatine phosphate During glycolysis number of ATP mol (a) 6 (b) 2 (c) 3 The electronic transition corresponding (a) $\sigma \rightarrow \sigma^*$ (b) $\pi \rightarrow \pi^*$ (c) note in the electronic transition corresponding (a) $Low S_1 \rightarrow S_2$ energy gap (b) History (c) Low $Low S_1 \rightarrow T_1$ energy gap (d) History (e) E-type delayed fluorescence (d) Boson Solutions (e) $Low S_1 \rightarrow T_1$ gap, (d) History (e) $Low S_1 \rightarrow T_1$ gap, (e) $Low S_1 \rightarrow T_1$ gap, (f) History (e) $Low S_1 \rightarrow T_1$ gap, (d) History (e) $Low S_1 \rightarrow T_1$ gap, (e) $Low S_1 \rightarrow T_1$ gap, (f) History (e) $Low S_1 \rightarrow T_1$ gap, (g) History (e) $Low S_1 \rightarrow T_1$ gap, (e) $Low S_1 \rightarrow T_1$ gap, (f) History (e) $Low S_1 \rightarrow T_1$ gap, (h) History (e) $Low $ | (a) production of ATP is exergonic process (b) ATP is thermodynamically unstable but kine (c) no ATP is produced in TCA cycle (d) all statements are correct Main energy supply during muscle contraction h (a) ATP (b) Phospho-er (c) creatine phosphate (d) GTP The main energy cycle in biological system invo (a) NAD $^+$ -NADH (b) ATP (c) Creatine-Creatine phosphate (d) FAD During glycolysis number of ATP molecule pro (a) 6 (b) 2 (c) 3 The electronic transition corresponding to the hi (a) $\sigma \rightarrow \sigma^*$ (b) $\pi \rightarrow \pi^*$ (c) $\pi \rightarrow \pi^*$ Intersystem crossing is favoured by- (a) Low $S_1 \rightarrow S_2$ energy gap (b) High $S_1 \rightarrow T$ (c) Low $S_1 \rightarrow T_1$ energy gap (d) High $S_0 \rightarrow S_1$ Eosin shows- (a) Excimer (b) P-type delayed (c) E-type delayed fluorescence (d) Both (i) and (e) E-type delayed fluorescence- (a) Low $S_0 \rightarrow S_1$ gap, (b) High $S_0 \rightarrow S_1$ (c) Low $S_1 \rightarrow T_1$ gap, (d) High $S_1 \rightarrow T_1$ For chemiluminescence, the chemical reaction m (a) endothermic, (b) exoth (c) product is in the excited state (d) both Critical Forster distance is defined as the distance (a) 0.40 (b) 0.50 (c) 0.60 The rate constant for fluorescence is the lowest form (a) Br (b) I (c) Cl One Dobson unit (DU) is the thickness of ozone molecules per unit area is- (a) 2.69×10^{16} (b) 2.69×10^{10} | (a) production of ATP is exergonic process (b) ATP is thermodynamically unstable but kinetical (c) no ATP is produced in TCA cycle (d) all statements are correct Main energy supply during muscle contraction happ (a) ATP (b) Phospho-enol part (c) creatine phosphate (d) GTP The main energy cycle in biological system involves (a) NAD ⁺ -NADH (b) ATP-AD (c) Creatine-Creatine phosphate (d) FAD-FA (e) Creatine-Creatine phosphate (d) FAD-FA (e) Creatine-Creatine phosphate (d) FAD-FA (e) Creatine-Creatine phosphate (e) Copyrights of the higher (a) G (b) 2 (c) 3 The electronic transition corresponding to the higher (a) G (b) G (c) G (c) 3 The electronic transition corresponding to the higher (a) G (b) G (c) G (c) G (d) High G (e) G (e) Low G (f) | (a) production of ATP is exergonic process (b) ATP is thermodynamically unstable but kinetically stable (c) no ATP is produced in TCA cycle (d) all statements are correct Main energy supply during muscle contraction happens from (a) ATP (b) Phospho-enol pyruvate (c) creatine phosphate (d) GTP The main energy cycle in biological system involves (a) NAD¹-NADH (b) ATP-ADP (c) Creatine-Creatine phosphate (d) FAD-FADH ₂ During glycolysis number of ATP molecule produced is (a) 6 (b) 2 (c) 3 (d) 1 The electronic transition corresponding to the highest energy (a) $\sigma \rightarrow \sigma^*$ (b) $\pi \rightarrow \pi^*$ (c) $n \rightarrow \pi^*$ (d) $n \rightarrow \sigma^*$ (l) $n \rightarrow \sigma^*$ (l) $n \rightarrow \sigma^*$ (l) High $S_1 \rightarrow T_1$ energy gap (c) Low $S_1 \rightarrow S_2$ energy gap (d) High $S_1 \rightarrow T_1$ energy gap (e) Eosin shows-(a) Excimer (b) P-type delayed fluorescence (c) E-type delayed fluorescence (d) Both (i) and (ii) Norrish type I cleavage is-(a) α -cleavage (b) β -cleavage (c) γ -cleavage (d) None of these For P-type delayed fluorescence-(a) Low $S_0 \rightarrow S_1$ gap, (b) High $S_0 \rightarrow S_1$ gap, (c) Low $S_1 \rightarrow T_1$ gap, (d) High $S_1 \rightarrow T_1$ gap For chemiluminescence, the chemical reaction must be (a) endothermic, (b) exothermic, (c) product is in the excited state (d) both (ii) and (iii) Critical Forster distance is defined as the distance where energe (a) 0.40 (b) 0.50 (c) 0.60 (d) 1.00 The rate constant for fluorescence is the lowest for-(a) Br (b) I (c) CI (d) F One Dobson unit (DU) is the thickness of ozone layer that conmolecules per unit area is-(a) 2.69×10 ¹⁶ (b) 2.69×10 ¹⁰ | (a) production of ATP is exergonic process (b) ATP is thermodynamically unstable but kinetically stable (c) no ATP is produced in TCA cycle (d) all statements are correct Main energy supply during muscle contraction happens from (a) ATP (b) Phospho-enol pyruvate (c) creatine phosphate (d) GTP (d) FT (e) Creatine phosphate (d) GTP (e) Creatine-Creatine phosphate (d) FAD-FADP (e) Creatine-Creatine phosphate (d) FAD-FADH (e) Creatine-Creatine phosphate (d) FAD-FADH (e) Coratine-Creatine phosphate (d) FAD-FADH (e) Coratine-Creatine phosphate (e) $2 (c) 3 (d) 1$ (f) The electronic transition corresponding to the highest energy is-(a) $3 (c) (d) (d) (d) (d) (d) (d) (d) (d) (d) (d$ | (a) production of ATP is exergonic process (b) ATP is thermodynamically unstable but kinetically stable (c) no ATP is produced in TCA cycle (d) all statements are correct Main energy supply during muscle contraction happens from (a) ATP (b) Phospho-enol pyruvate (c) creatine phosphate (d) GTP The main energy cycle in biological system involves (a) NAD ⁺ -NADH (b) ATP-ADP (c) Creatine-Creatine phosphate (d) FAD-FADH ₂ . During glycolysis number of ATP molecule produced is (a) 6 (b) 2 (c) 3 (d) 1 The electronic transition corresponding to the highest energy is (a) $\sigma \rightarrow \sigma^*$ (b) $\pi \rightarrow \pi^*$ (c) $n \rightarrow \pi^*$ (d) $n \rightarrow \sigma^*$ Intersystem crossing is favoured by-(a) Low $S_1 \rightarrow S_2$ energy gap (b) High $S_1 \rightarrow T_1$ energy gap (c) Low $S_1 \rightarrow T_1$ energy gap (d) High $S_0 \rightarrow S_1$ energy gap (e) E-spin shows-(a) Excimer (b) P-type delayed fluorescence (c) E-type delayed fluorescence (d) Both (i) and (ii) Norrish type I cleavage is-(a) $\sigma \rightarrow T_1$ (b) $\sigma \rightarrow T_2$ (d) None of these For P-type delayed fluorescence-(a) Low $\sigma \rightarrow T_1$ gap, (b) High $\sigma \rightarrow T_2$ gap, (c) Low $\sigma \rightarrow T_1$ gap, (d) High $\sigma \rightarrow T_2$ gap, (e) Low $\sigma \rightarrow T_1$ gap, (d) High $\sigma \rightarrow T_2$ gap, (e) product is in the excited state (d) both (ii) and (iii) Critical Forster distance is defined as the distance where energy transfer efficical $\sigma \rightarrow T_2$ (d) $\sigma \rightarrow T_2$ (e) $\sigma \rightarrow T_2$ (e) $\sigma \rightarrow T_2$ (f) |

- 20. The role of promoter is-
 - (a) Increases the rate of the reaction
 - (b) Decreases the rate of the reaction
 - (c) Increases the activity of the catalyst
 - (d) Decreases the activity of the catalyst
