## B.Sc. (Part—III) Semester—VI Examination 6S PCH: PETROCHEMICAL SCIENCE

<ul> <li>(i) Shift conversion is more commonly known as shift conversion.</li> <li>(ii) UV spectrum is called as</li> <li>(iii) involves the interaction between electromagnetic radiation with matter.</li> <li>(iv) Synthesis gas is mixture of</li> <li>(iv) The most useful region for infra-red spectroscopy is</li> <li>(a) 2.5 μ to 15 μ</li></ul>	Time : Three Hours]					[Maximum Marks: 80					
(3) Give chemical equation and diagram wherever necessary.  1. (A) Fill in the blanks with appropriate words: (i) Shift conversion is more commonly known as shift conversion. (ii) UV spectrum is called as  (iii) involves the interaction between electromagnetic radiation with matter. (iv) Synthesis gas is mixture of  (j) Synthesis gas is mixture of  (j) Choose correct alternative: (i) The most useful region for infra-red spectroscopy is  (a) 2.5 μ to 15 μ (b) 15 μ to 25 μ (c) 0.8 μ to 2.5 μ (d) 1.5 μ to 2.5 μ (ii) The is the proper catalyst which is solely responsible for the particular catalytic activity.  (a) Promotor (b) Catalyst support (c) Active mass (d) Texture (iii) The unit of frequency is  (a) Hertz (b) λ (c) cm (d) nm (iv) type of transition occurs in sigma bonded molecule only.  (a) π → π* (b) η → σ* (c) σ → σ* (C) Answer the following in one sentence each: (i) What is spectrophotometer? (ii) What is wavelength? (iii) What is the term "promotor" in catalyst? (iv) What do you mean by "biological oxygen demand"?  1×4=4  2. (A) Describe the following with respect to their definition, formula and units: (i) Energy (3) (ii) Wave number (3) (iii) Wave length (3) (iv) Frequency. (6)  OR  3. (P) Discuss the different regions of electromagnetic spectrum. (6) (Q) Describe uses of ultra-violet spectroscopy in different fields. (6)		Note	e :	-(1)	Question No. 1 is	s compulsory.					
(3) Give chemical equation and diagram wherever necessary.  1. (A) Fill in the blanks with appropriate words: (i) Shift conversion is more commonly known as shift conversion. (ii) UV spectrum is called as  (iii) involves the interaction between electromagnetic radiation with matter. (iv) Synthesis gas is mixture of  (j) Synthesis gas is mixture of  (j) Choose correct alternative: (i) The most useful region for infra-red spectroscopy is  (a) 2.5 μ to 15 μ (b) 15 μ to 25 μ (c) 0.8 μ to 2.5 μ (d) 1.5 μ to 2.5 μ (ii) The is the proper catalyst which is solely responsible for the particular catalytic activity.  (a) Promotor (b) Catalyst support (c) Active mass (d) Texture (iii) The unit of frequency is  (a) Hertz (b) λ (c) cm (d) nm (iv) type of transition occurs in sigma bonded molecule only.  (a) π → π* (b) η → σ* (c) σ → σ* (C) Answer the following in one sentence each: (i) What is spectrophotometer? (ii) What is wavelength? (iii) What is the term "promotor" in catalyst? (iv) What do you mean by "biological oxygen demand"?  1×4=4  2. (A) Describe the following with respect to their definition, formula and units: (i) Energy (3) (ii) Wave number (3) (iii) Wave length (3) (iv) Frequency. (6)  OR  3. (P) Discuss the different regions of electromagnetic spectrum. (6) (Q) Describe uses of ultra-violet spectroscopy in different fields. (6)				(2)	Remaining SIX o	uestions carry 12 n	narks	s each.			
<ul> <li>(i) Shift conversion is more commonly known as shift conversion.</li> <li>(ii) UV spectrum is called as</li> <li>(iii) involves the interaction between electromagnetic radiation with matter.</li> <li>(iv) Synthesis gas is mixture of</li> <li>(iv) The most useful region for infra-red spectroscopy is</li> <li>(a) 2.5 μ to 15 μ</li></ul>				(3)	Give chemical eq	uation and diagram	whe	rever necessary.			
<ul> <li>(ii) UV spectrum is called as</li></ul>	1.	(A)									
(iii) involves the interaction between electromagnetic radiation with matter. (iv) Synthesis gas is mixture of \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qqqq \qqqqq \qqqq \qqqqq \qqqqqq			(i)	Shi	ft conversion is mo	ore commonly know	n as	shift conversion	1.		
(iv) Synthesis gas is mixture of \begin{align*} a			(ii)	UV	spectrum is called	i as					
(B) Choose correct alternative :  (i) The most useful region for infra-red spectroscopy is  (a) $2.5 \mu$ to $15 \mu$ (b) $15 \mu$ to $25 \mu$ (c) $0.8 \mu$ to $2.5 \mu$ (d) $1.5 \mu$ to $2.5 \mu$ (ii) The is the proper catalyst which is solely responsible for the particular catalytic activity.  (a) Promotor (b) Catalyst support  (c) Active mass (d) Texture  (iii) The unit of frequency is  (a) Hertz (b) $\lambda$ (c) cm (d) nm  (iv) type of transition occurs in sigma bonded molecule only.  (a) $\pi \to \pi^*$ (b) $\eta \to \sigma^*$ (c) $\sigma \to \sigma^*$ $\frac{1}{2} \times 4 = 2$ (C) Answer the following in one sentence each :  (i) What is spectrophotometer?  (ii) What is wavelength?  (iii) What is the term "promotor" in catalyst?  (iv) What do you mean by "biological oxygen demand"? 1 × 4 = 4  2. (A) Describe the following with respect to their definition, formula and units:  (i) Energy 3  (ii) Wave number 3  (iii) Wave length 3  (iv) Frequency. 3  OR  3. (P) Discuss the different regions of electromagnetic spectrum. 6  (Q) Describe uses of ultra-violet spectroscopy in different fields. 6			(iii)	_	involves the	interaction between	elec	tromagnetic radiation wi	th matter.		
(i) The most useful region for infra-red spectroscopy is  (a) $2.5 \mu$ to $15 \mu$ (b) $15 \mu$ to $25 \mu$ (c) $0.8 \mu$ to $2.5 \mu$ (d) $1.5 \mu$ to $2.5 \mu$ (ii) The is the proper catalyst which is solely responsible for the particular catalytic activity.  (a) Promotor (b) Catalyst support (c) Active mass (d) Texture  (iii) The unit of frequency is  (a) Hertz (b) $\lambda$ (c) cm (d) nm  (iv) type of transition occurs in sigma bonded molecule only.  (a) $\pi \to \pi^*$ (b) $\eta \to \sigma^*$ (c) $\sigma \to \sigma^*$ $\frac{1}{2} \times 4 = 2$ (C) Answer the following in one sentence each:  (i) What is spectrophotometer?  (ii) What is wavelength?  (iii) What oy ou mean by "biological oxygen demand"? $\frac{1}{2} \times 4 = 2$ 2. (A) Describe the following with respect to their definition, formula and units:  (i) Energy 3  (ii) Wave number 3  (iii) Wave length 3  (iv) Frequency. 3  OR  3. (P) Discuss the different regions of electromagnetic spectrum. 6  Q) Describe uses of ultra-violet spectroscopy in different fields. 6			(iv)	Syn	thesis gas is mixtu	re of			¹⁄₂×4=2		
(a) $2.5 \mu$ to $15 \mu$ (b) $15 \mu$ to $25 \mu$ (c) $0.8 \mu$ to $2.5 \mu$ (d) $1.5 \mu$ to $2.5 \mu$ (ii) The is the proper catalyst which is solely responsible for the particular catalytic activity.  (a) Promotor (b) Catalyst support (c) Active mass (d) Texture  (iii) The unit of frequency is  (a) Hertz (b) $\lambda$ (c) cm (d) nm  (iv) type of transition occurs in sigma bonded molecule only.  (a) $\pi \to \pi^*$ (b) $\eta \to \sigma^*$ (c) $\sigma \to \sigma^*$ $\frac{1}{2} \times 4=2$ (C) Answer the following in <b>one</b> sentence each:  (i) What is spectrophotometer?  (ii) What is the term "promotor" in catalyst?  (iv) What do you mean by "biological oxygen demand"?  1 × 4=4  2. (A) Describe the following with respect to their definition, formula and units:  (i) Energy 3  (ii) Wave number 3  (iii) Wave length 3  (iv) Frequency. 3  OR  3. (P) Discuss the different regions of electromagnetic spectrum. 6  (Q) Describe uses of ultra-violet spectroscopy in different fields. 6		(B)	Cho	ose o	correct alternative						
<ul> <li>(c) 0.8 μ to 2.5 μ</li> <li>(d) 1.5 μ to 2.5 μ</li> <li>(ii) The</li></ul>			(i)	The	e most useful regio	n for infra-red spec	trosc	copy is			
<ul> <li>(ii) The is the proper catalyst which is solely responsible for the particular catalytic activity.</li> <li>(a) Promotor (b) Catalyst support</li> <li>(c) Active mass (d) Texture</li> <li>(iii) The unit of frequency is</li> <li>(a) Hertz (b) λ</li> <li>(c) cm (d) nm</li> <li>(iv) type of transition occurs in sigma bonded molecule only.</li> <li>(a) π → π* (b) η → σ*</li> <li>(c) σ → σ* ½×4=2</li> <li>(C) Answer the following in one sentence each:</li> <li>(i) What is spectrophotometer?</li> <li>(ii) What is wavelength?</li> <li>(iii) What is the term "promotor" in catalyst?</li> <li>(iv) What do you mean by "biological oxygen demand"? 1×4=4</li> <li>2. (A) Describe the following with respect to their definition, formula and units:</li> <li>(i) Energy 3</li> <li>(ii) Wave number 3</li> <li>(iii) Wave length 3</li> <li>(iv) Frequency. 3</li> <li>3</li> <li>(P) Discuss the different regions of electromagnetic spectrum. 6</li> <li>(Q) Describe uses of ultra-violet spectroscopy in different fields. 6</li> </ul>				(a)	$2.5~\mu$ to $15~\mu$		(b)	15 μ to 25 μ			
activity.  (a) Promotor (b) Catalyst support (c) Active mass (d) Texture  (iii) The unit of frequency is  (a) Hertz (b) $\lambda$ (c) cm (d) nm  (iv) type of transition occurs in sigma bonded molecule only.  (a) $\pi \to \pi^*$ (b) $\eta \to \sigma^*$ (c) $\sigma \to \sigma^*$ (d) $\eta \to \sigma^*$ (e) $\sigma \to \sigma^*$ (f) What is spectrophotometer?  (ii) What is wavelength? (iii) What is the term "promotor" in catalyst? (iv) What do you mean by "biological oxygen demand"?  (iv) Energy (iv) Wave number (iv) Energy (iv) Wave length (iv) Frequency.  OR  3. (P) Discuss the different regions of electromagnetic spectrum. (O) Describe uses of ultra-violet spectroscopy in different fields.				(c)	$0.8~\mu$ to $2.5~\mu$		(d)	$1.5~\mu$ to $2.5~\mu$			
(c) Active mass (d) Texture  (iii) The unit of frequency is			(ii)			per catalyst which is	sole	ly responsible for the part	ticular catalytic		
<ul> <li>(iii) The unit of frequency is</li></ul>				(a)	Promotor		(b)	Catalyst support			
<ul> <li>(a) Hertz</li> <li>(b) λ</li> <li>(c) cm</li> <li>(d) nm</li> <li>(iv) type of transition occurs in sigma bonded molecule only.</li> <li>(a) π → π*</li> <li>(b) η → σ*</li> <li>(c) σ → σ*</li> <li>(d) η → σ*</li> <li>(e) σ → σ*</li> <li>(f) Answer the following in one sentence each:</li> <li>(i) What is spectrophotometer?</li> <li>(ii) What is wavelength?</li> <li>(iii) What do you mean by "biological oxygen demand"?</li> <li>(iv) What do you mean by "biological oxygen demand"?</li> <li>(iv) Energy</li> <li>(ii) Energy</li> <li>(iii) Wave number</li> <li>(iii) Wave length</li> <li>(iv) Frequency.</li> <li>3</li> <li>(iv) Discuss the different regions of electromagnetic spectrum.</li> <li>(d) Describe uses of ultra-violet spectroscopy in different fields.</li> <li>6</li> </ul>				(c)	Active mass		(d)	Texture			
<ul> <li>(c) cm</li> <li>(d) nm</li> <li>(iv) type of transition occurs in sigma bonded molecule only.</li> <li>(a) π → π*</li> <li>(b) η → σ*</li> <li>(c) σ → σ*</li> <li>(d) Answer the following in one sentence each:</li> <li>(i) What is spectrophotometer?</li> <li>(ii) What is wavelength?</li> <li>(iii) What is the term "promotor" in catalyst?</li> <li>(iv) What do you mean by "biological oxygen demand"?</li> <li>(iv) What do you mean by "biological oxygen demand"?</li> <li>(i) Energy</li> <li>(ii) Energy</li> <li>(iii) Wave number</li> <li>(iii) Wave length</li> <li>(iv) Frequency.</li> <li>3</li> <li>(iv) Frequency.</li> <li>3</li> <li>(iv) Frequency.</li> <li>3</li> <li>(iv) Frequency.</li> <li>3</li> <li>(iv) Discuss the different regions of electromagnetic spectrum.</li> <li>(iv) Describe uses of ultra-violet spectroscopy in different fields.</li> <li>6</li> </ul>			(iii)	The	unit of frequency	is					
<ul> <li>(iv) type of transition occurs in sigma bonded molecule only. <ul> <li>(a) π → π*</li> <li>(b) η → σ*</li> <li>(c) σ → σ*</li> <li>(d) Answer the following in one sentence each:</li> <li>(i) What is spectrophotometer?</li> <li>(ii) What is wavelength?</li> <li>(iii) What is the term "promotor" in catalyst?</li> <li>(iv) What do you mean by "biological oxygen demand"?</li> </ul> </li> <li>2. (A) Describe the following with respect to their definition, formula and units: <ul> <li>(i) Energy</li> <li>(ii) Wave number</li> <li>(iii) Wave length</li> <li>(iv) Frequency.</li> </ul> </li> <li>3</li> <li>(iv) Frequency.</li> <li>3</li> </ul> <li>3. (P) Discuss the different regions of electromagnetic spectrum.</li> <li>(a) Describe uses of ultra-violet spectroscopy in different fields.</li>				(a)	Hertz		(b)	λ			
<ul> <li>(a) π → π* (b) η → σ* (c) σ → σ* (d) Answer the following in one sentence each: (i) What is spectrophotometer? (ii) What is wavelength? (iii) What is the term "promotor" in catalyst? (iv) What do you mean by "biological oxygen demand"?  2. (A) Describe the following with respect to their definition, formula and units: (i) Energy (ii) Wave number (iii) Wave length (iv) Frequency.  OR  3. (P) Discuss the different regions of electromagnetic spectrum. (Q) Describe uses of ultra-violet spectroscopy in different fields. (6)</li> </ul>				(c)	cm		(d)	nm			
<ul> <li>(c) σ → σ*</li> <li>(d) Answer the following in one sentence each: <ul> <li>(i) What is spectrophotometer?</li> <li>(ii) What is wavelength?</li> <li>(iii) What is the term "promotor" in catalyst?</li> <li>(iv) What do you mean by "biological oxygen demand"?</li> </ul> </li> <li>2. (A) Describe the following with respect to their definition, formula and units: <ul> <li>(i) Energy</li> <li>(ii) Wave number</li> <li>(iii) Wave length</li> <li>(iv) Frequency.</li> </ul> </li> <li>3 <ul> <li>(iv) Frequency.</li> </ul> </li> <li>3 <ul> <li>(iv) Frequency.</li> <li>3</li> </ul> </li> <li>3. (P) Discuss the different regions of electromagnetic spectrum.</li> <li>6</li> <li>(Q) Describe uses of ultra-violet spectroscopy in different fields.</li> <li>6</li> </ul>			(iv)		type of trans	ition occurs in sign	ia bo	nded molecule only.			
(C) Answer the following in one sentence each:  (i) What is spectrophotometer?  (ii) What is wavelength?  (iii) What is the term "promotor" in catalyst?  (iv) What do you mean by "biological oxygen demand"?  2. (A) Describe the following with respect to their definition, formula and units:  (i) Energy  (ii) Wave number  3  (iii) Wave length  3  (iv) Frequency.  OR  3. (P) Discuss the different regions of electromagnetic spectrum.  6  (Q) Describe uses of ultra-violet spectroscopy in different fields.  6				(a)	$\pi \rightarrow \pi^*$		(b)	$\eta \rightarrow \sigma^*$			
(i) What is spectrophotometer? (ii) What is wavelength? (iii) What is the term "promotor" in catalyst? (iv) What do you mean by "biological oxygen demand"?  2. (A) Describe the following with respect to their definition, formula and units: (i) Energy 3 (ii) Wave number 3 (iii) Wave length 3 (iv) Frequency.  OR  3. (P) Discuss the different regions of electromagnetic spectrum. (Q) Describe uses of ultra-violet spectroscopy in different fields. 6				` /					$\frac{1}{2} \times 4 = 2$		
(ii) What is wavelength? (iii) What is the term "promotor" in catalyst? (iv) What do you mean by "biological oxygen demand"?  2. (A) Describe the following with respect to their definition, formula and units: (i) Energy (ii) Wave number (iii) Wave length (iv) Frequency.  OR  3. (P) Discuss the different regions of electromagnetic spectrum. (Q) Describe uses of ultra-violet spectroscopy in different fields.  6		(C) Answer the following in <b>one</b> sentence each:									
(iii) What is the term "promotor" in catalyst? (iv) What do you mean by "biological oxygen demand"?  1×4=4  2. (A) Describe the following with respect to their definition, formula and units: (i) Energy (ii) Wave number (iii) Wave length (iv) Frequency.  OR  3. (P) Discuss the different regions of electromagnetic spectrum. (Q) Describe uses of ultra-violet spectroscopy in different fields. 6						meter?					
(iv) What do you mean by "biological oxygen demand"?  1×4=4  2. (A) Describe the following with respect to their definition, formula and units:  (i) Energy  (ii) Wave number  (iii) Wave length  (iv) Frequency.  OR  3. (P) Discuss the different regions of electromagnetic spectrum.  (Q) Describe uses of ultra-violet spectroscopy in different fields.  6			(ii)		_						
2. (A) Describe the following with respect to their definition, formula and units:  (i) Energy  (ii) Wave number  (iii) Wave length  (iv) Frequency.  OR  3. (P) Discuss the different regions of electromagnetic spectrum.  (Q) Describe uses of ultra-violet spectroscopy in different fields.  6			. /		•	•					
(i) Energy (ii) Wave number 3 (iii) Wave length 3 (iv) Frequency.  OR  OR  (Q) Describe uses of ultra-violet spectroscopy in different fields.  6	_				-				1×4=4		
(ii) Wave number  (iii) Wave length  (iv) Frequency.  OR  3. (P) Discuss the different regions of electromagnetic spectrum.  (Q) Describe uses of ultra-violet spectroscopy in different fields.  6	2.	(A)			on, formula and units:	_					
(iii) Wave length (iv) Frequency.  OR  3. (P) Discuss the different regions of electromagnetic spectrum. (Q) Describe uses of ultra-violet spectroscopy in different fields. 6											
(iv) Frequency.  OR  3. (P) Discuss the different regions of electromagnetic spectrum.  (Q) Describe uses of ultra-violet spectroscopy in different fields.  6			. ,								
OR  3. (P) Discuss the different regions of electromagnetic spectrum.  (Q) Describe uses of ultra-violet spectroscopy in different fields.  6					•						
3. (P) Discuss the different regions of electromagnetic spectrum. 6 (Q) Describe uses of ultra-violet spectroscopy in different fields. 6			(iv)	Free	quency.				3		
(Q) Describe uses of ultra-violet spectroscopy in different fields.						OR					
	3.	(P)	(P) Discuss the different regions of electromagnetic spectrum.								
		(Q)	Des	cribe	e uses of ultra-viole	et spectroscopy in d	iffere	ent fields.	6		
WPZ—3385 1 (Contd.)	WP	Z338	35			1			(Contd.)		

http://www.sgbauonline.com/

4.	(A)	What are the application of N.M.R. spectroscopy?	6
	(B)	On which principal mass spectroscopy is based?	6
		OR	
5.	(P)	Discuss working of mass spectrometer in detail.	6
	(Q)	Which important features are highlighted in N.M.R. spectroscopy?	6
6.	(A)	Which are important characteristic features of HPLC?	6
	(B)	What is gas chromatography? Describe theory of gas chromatography.	6
		OR	
7.	(P)	Describe the applications of HPLC.	6
	(Q)	Describe instrumentation technique involved in gas chromatography.	6
8.	(A)	'Activity of catalyst depends on its morphology'. Why? Explain in detail.	6
	(B)	Which different catalysts are used in petroleum refining? Describe with respect to the processes and catalyst used in those processes.	heir 6
		OR	
9.	(P)	Describe the following in detail:	
		Polymerization catalyst	4
		(ii) Hydrocarbon oxidation catalyst	4
		(iii) Hydrogenation catalyst.	4
10.	(A)	Biomass is a renewable resource for petrochemical; why? Explain with examples.	8
	(B)	In future heavy feedstocks will be used in petrochemical industries. Why?	4
		OR	
11.	(P)	Describe synthetic fuels. Why hydrogen acts as a fuel of tomorrow? Describe advanta of hydrogen fuel.	ages 8
	(Q)	Discuss the development of cracking technology in petrochemical industries.	4
12.	(A)	How we will calculate D.O. in laboratory? Explain with respect to their formula procedure.	and 8
	(B)	What is air pollution?	4
		OR	
13.	(P)	What is water pollution? Describe their impact on our earth.	6
	(Q)	What is COD? Why petrochemical industries calculate COD of their effluent stream	s?