പതിനാലാം കേരള നിയമസഭ
നാലാം സമ്മേളനം

നക്ഷത്രചിഹ്നമിടാത്ത ചോദ്യംനം. 2877 10.03.2017-ൽ മറുപടിക്ക് ഉണ്ടായിരുന്നത്

സമുദ്രപഠനം

	ചോദ്യം		ഉത്തരം
	പ്രൊഫ. ആബിദ് ഹുസൈൻ തങ്ങൾ		**ശ്രീമതി. ജെ.മേഴ്സിക്കുട്ടി അമ്മ** (മത്സ്യബന്ധനവും ഹാർബർ എഞ്ചിനീയറിംഗും കശുവണ്ടി വ്യവസായവും വകുപ്പുമന്ത്രി)
(എ)	സമുദ്രപഠനവുമായി ബന്ധപ്പെട്ട് പ്രവർത്തിക്കുന്ന കേന്ദ്ര, സംസ്ഥാന സർക്കാർ ഓഫീസുകൾ ഏതൊക്കെയാണ്; പ്രസ്തുത ഓഫീസുകളിലെ പഠനം സംബന്ധിച്ച് വിശദാംശം നൽകുമോ;	(എ)	ഫിഷറീസ് സമുദ്രപഠന സർവ്വകലാശാല സമുദ്രപഠനവുമായി ബന്ധപ്പെട്ട് സംസ്ഥാന സർക്കാരിന്റെ കീഴിൽ പ്രവർത്തിക്കുന്നു. ഈ സർവ്വകലാശാലയിൽ വിവിധ വിഷയങ്ങളിലായി ഒരു ബിരുദ കോഴ്സും 30 ബിരുദാനന്തര ബിരുദ കോഴ്സുകളും 13 വകുപ്പുകളിൽ പി.എച്ച്.ഡി യും നിലവിൽ നടന്നുവരുന്നു. സമുദ്ര പഠനവുമായി ബന്ധപ്പെട്ട് കേരളത്തിൽ പ്രവർത്തിക്കുന്ന കേന്ദ്ര സംസ്ഥാന സർക്കാർ ഓഫീസുകൾ താഴെ പറയുന്നു. 1. കേരള യൂണിവേഴ്സിറ്റി ഓഫ് ഫിഷറീസ് ആന്റ് ഓഷ്യൻ സ്റ്റഡീസ് (KUFOS) 2. കൊച്ചിൻ യൂണിവേഴ്സിറ്റി ഓഫ് സയൻസ് ആന്റ് ടെക്നോളജി (CUSAT) 3. സെൻട്രൽ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഓഫ് ഫിഷറീസ് ടെക്നോളജി (CIFT) 4. സെൻട്രൽ മറൈൻ ഫിഷറീസ് റിസർച്ച് ഇൻസ്റ്റിറ്റ്യൂട്ട് (CMFRI) 5. നാഷണൽ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഓഫ് ഓഷ്യനോഗ്രാഫി (NIO) 6. സെൻട്രൽ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഓഫ് ഫിഷറീസ് നോട്ടിക്കൽ ആന്റ് എഞ്ചിനീയറിംഗ് ട്രെയിനിംഗ് (CIFNET) പഠനം സംബന്ധിച്ച വിശദാംശം അനുബന്ധം (1) ൽ ചേർക്കുന്നു.

(ബി)	ഗവേഷണങ്ങൾ കൂടുതൽ കാര്യക്ഷമമാക്കുന്നതിനുള്ള നടപടി സ്വീകരിക്കുമോ;	(ബി)	ഫിഷറീസ് സർവ്വകലാശാലയിൽ ഗവേഷണങ്ങൾ ഫലപ്രദമായി നടന്നു വരുന്നു. ഗവേഷണ ഫലങ്ങൾ കർഷകരിലേക്ക് എത്തിക്കുന്നതിന് സർവ്വകലാശാലയുടെ വിജ്ഞാന വ്യാപന വിഭാഗം നടപടികൾ സ്വീകരിക്കുന്നുണ്ട്.
(സി)	ഇത്തരം സ്ഥാപനങ്ങളിൽ ഏതെല്ലാം കോഴ്സുകൾ നിലവിലുണ്ടെന്നും പ്രസ്തുത കോഴ്സുകൾക്ക് ആവശ്യമായ ഇടർ പഠനത്തിനും പരിശീലനത്തിനുമുള്ള നടപടി സ്വീകരിക്കുമോയെന്നും വ്യക്തമാക്കുമോ?	(സി)	ഫിഷറീസ് സർവ്വകലാശാലയിൽ ബാച്ചിലർ ഓഫ് ഫിഷറീസ് സയൻസ് എന്ന ഒരു ബിരുദതല കോഴ്സും ബിരുദാനന്തര ബിരുദതല (ലിസ്റ്റ് അനുബന്ധമായി ചേർക്കുന്നു) കോഴ്സുകളും നിലവിലുണ്ട്. ഇടർ പഠനത്തിനും ഗവേഷണത്തിനുമുള്ള നടപടികൾ സ്വീകരിക്കുന്നുണ്ട്. മറ്റു സ്ഥാപനങ്ങളിലെ വിവരങ്ങൾ അനുബന്ധം 2 ആയി ചേർക്കുന്നു.

സെക്ഷൻ ഓഫീസർ

അനുബന്ധം - 1

CUSAT

Departments working under CUSAT

1. School of Industrial Fisheries
2. School of Marine sciences
   a. Department of atmospheral Sciences
   b. Department of Chemical Oceanography
   c. Department of Marine Biology, Micro biology and Bio chemistry
   d. Department of Marine Geology and Geo-Physics
   e. Department of Physical Oceanogrphy
3. National Centre for Aquatic Animal Health

KUFOS

Courses under KUFOS

1. Bachelors Degree in various subjects
2. Masters Degree course - 30
3. Ph.D in 13 departments

NIO

In addition to basic research, the institute also carries out applied research sponsored by the industry. These studies include oceanographic data collection, environmental impact assessment, and modelling to predict environmental impact. The institute also provides consultancy on a number of issues including marine environmental protection and coastal zone regulations.

With the largest collection of ocean scientists in the country, and equipped with suitable ocean research infrastructure, CSIR-NIO serves as an advanced centre of education in ocean sciences. It has a School of Oceanography under the Academy of Scientific & Innovative Research (AcSIR). In addition, it is a recognized centre for doctoral research by a large number of universities. There are at present over 100 Junior/Senior Research Fellows (qualified through CSIR/UGC eligibility criterion) pursuing their doctoral studies in the institute. In addition, about 300 undergraduate and postgraduate students pursue their project research at this institute every year.

CIFNET

It promotes studies and research on marine science and technology, marine environment, socio-economic, legal and other related fields. CIFNET was the only government Nautical college till 2007, when the Indian Maritime University was created.

The institute arranges training programmes for foreign nationals from countries like Nigeria, Oman, Maldives, Bangladesh, Sri Lanka, Philippines, Zambia, Ghana, Tanzania, Sudan, Yemen, Laos etc. under schemes like FAO fellowship,CFTC,SCAAP,Colombo plan,ITEC etc.

The institute has three training vessels, mainly used for imparting onboard practical training for institutional trainees and for providing qualifying sea service for post-institutional trainees of the institute. The vessels Prashikshani is attached to the headquarters at Kochi, the other two vessels Skipper II and M.V Tharangini are based at Chennai unit and Visakhapatnam unit.

The ICAR-CIFT was established as the Central Fisheries Technological Research Station on the recommendations of a high power committee constituted by the Ministry of Food and Agriculture, Government of India. It started functioning at Cochin on 29th April 1957, under the Department of Agriculture of the then Ministry of Food and Agriculture. The Institute was given its present name in 1962. The administrative control of the Institute was brought under the Indian Council of Agricultural Research from 1st October, 1967. The Headquarters of the Institute is at Cochin with Research Centres at Veraval (Gujarat), Visakhapatnam (Andhra Pradesh) and Mumbai (Maharashtra) and research work of the Institute is orchestrated through seven Divsions viz., (i) Fishing Technology Division, (ii) Fish Processing Division, (iii) Quality Assurance & Management Division, (iv) Biochemistry and Nutrition Division, (v) Microbiology, Fermentation and Biotechnology Division, (vi) Engineering Division and (vii) Extension, Information and Statistics Division.

The Institute currently functions within the following mandate:

- Basic and strategic research in fishing and processing.
- Design and develop energy efficient fishing systems for responsible fishing and sustainable management
- Development of implements and machinery for fishing and fish processing.
- Human resource Development through training, education and extension.

Activities undertaken by the Institute

ICAR-CIFT is the only National Centre in the country where research in all disciplines relating to fishing and fish processing is undertaken. Major activities undertaken at the Institute are: (1) basic, strategic and applied research in fishing and fish processing; (2) development of designs for fuel efficient fishing vessels and fishing gear for responsible fishing; (3) development of technologies for commercial isolation of bioactive compounds and industrially important products from fish and fishery wastes; (4) designing of innovative implements and machineries for fishing and fish processing and pilot plants for facilitating commercialization of technologies developed; (5) advanced research in food safety in fish and fishery products; and (6) providing training and consultancy services in fishing and fish processing.

The Institute has been instrumental in modernising both the fishing and fish processing sectors in the country. The interventions have resulted in better harvesting and utilization of fishery resources.A quick glance at the salient research achievements of the Institute stands testimony to this.

Harvest Sector

- Design development of mechanized fishing vessels: ICAR-CIFT developed and popularized 12 standard designs of fishing vessels in the size range 7.67-15.24 m, suitable for various types of fishing under Indian conditions.
- Developed a 15.5 m, multi-purpose deep sea fishing vessel, Sagar Kripa with steel hull with energy saving features.
- Designed a 19.8m fuel saving multi-purpose deep sea fishing vessel with facilities for deep sea fishing with options to carry out trawling, gillnetting and long lining operations. Compared to the similar sized fishing vessels requires only 20% power for propulsion and results in savings of approximately 50,000 litres of fuel in an year.
- A Solar Boat with length of 3.6 m developed by the Institute is solely propelled by solar power and is capable of running for 2.5 to 3.0 hours after complete charging and attains a speed of nearly 4.0 knots in calm waters.
- Low cost wood such as rubber wood and coconut wood for substituting are developed by CIFT as substitutes for conventional boat building timber for fishing craft sector.
- Institute was instrumental in standardizing synthetic netting and rope in place of cotton netting; jute and coir ropes etc for fishing purposes. HDPE and ploy propylene (PP) gillnets with cost savings of 35-52% and 10% compared to the commonly used polyamide gillnets were demonstrated and popularized. Research on substitution of material for trawl and purse seine by new generation fishing gear material like ultra-high molecular weight polyethylene, for energy saving is currently being undertaken.
- Six new designs of eco-friendly and resource specific demersal trawls were developed which do not drag bottom debris and benthos and preserve the bottom ecology of the trawling grounds. Different low drag trawls like, long wing trawls, high opening trawls, short-body trawls, Cut-away top belly trawls and large mesh trawls were designed and developed.
- Developed Semi-pelagic trawl system (CIFT SPTS-1) as an alternative to shrimp trawling in the small-scale mechanized trawler sector which helps in considerably reducing the bottom contact of trawls, reduction of bycatch and savings in fuel consumption due to reduced drag.
- Large-mesh purse seines along with hydraulic power block for the mechanized sector targeting large pelagic fishes was introduced which led to the revival of small mechanized purse seine fishery.
- Developed an optimized long line winch for tuna long lining. The design is capable of significant reduction in labour required for commercial tuna long lining operations.
- V-form otter boards designed and popularized by the Institute have helped in eco-friendly trawling which has become popular along Gujarat, Andhra Pradesh and Kerala coasts.
- About eight different Bycatch Reduction Device (BRD) designs including the WWF award winning JFE-SSD were designed and standardized.
- Turtle Excluder Device (TED) certification is mandatory for export of shrimp caught from shrimp trawl nets. Hence, CIFT designed and developed an indigenous version of

Turtle TED superior in performance to imported TEDs. As of now four states, namely Kerala, Andhra Pradesh, Orissa and West Bengal have introduced TED regulations for mechanized trawler fleet.

- Introduced large mesh gill nets and monolines (monofilament long lines) in Lakshadweep waters, in an effort to diversify fishing methods and to tap the unexploited rich tuna resources.
- Directives on Length-power combination for fishing vessels: Worked out the maximum allowable engine horsepower for different classes and types of fishing vessels.
- Designed and fabricated new collapsible fish trap and crab trap for the helping the poor fishermen operating fish traps. A fisherman can transport and easily operate 10-15 traps using a canoe unlike the traditional traps.
- Developed energy efficient propellers and equipped the propeller manufacturers for making energy saving propellers in ring seine vessels and dol-netters mainly operated by small-scale fishermen.

Post Harvest Sector

Suitable technologies on production of value added products and byproducts, waste utilization and effluent treatment have been developed and transferred to the industry. Some of technological developments in post-harvest sector in India facilitated by CIFT are:

- Standardized the protocols for freezing, canning and drying of commercially important fishes and shellfishes which have been adopted by BIS as standard processing protocols.
- Attractive ready-to-cook products from fish and shellfish have been developed, standardized and commercialized.
- Technology for production of ready-to-eat retortable pouch fish and shellfish products which have a shelf life of more than one year at room temperature was standardized and transferred to several prospective entrepreneurs.
- Standardized the production of extruded products by incorporating fish and "*Fish Kure*" is one such product which was commercialized and has become very popular.
- Developed processes for battering and breading of a variety of products based on fish and shellfish.
- Standardized the optimum concentration of various gases in Modified atmosphere packaging (MAP) by the application of CO_2 to fresh fish in chilled condition for different products to get maximum shelf life and retention of quality.
- Technology standardized for production from fish and shell fish waste of products like Chitin, Chitosan, Glucosamine, Surgical sutures, Isinglass, Gelatin and collagen peptide, Fish silage, Squalene, Chondroitin sulphate, artificial skin etc which have great application in the pharmaceutical, cosmetic and food industries. Different technologies were successfully transferred to several entrepreneurs.
- Perfected an indigenous technology for concentration and encapsulation of Omega-3 from sardine oil and also for the preparation of fatty acid ethyl esters for incorporation in feed formulation. PUFA enriched eggs and chicken meat were commercially produced and a price gain of 40% on eggs and 50% on meat was observed in the market, with the new technology.
- An edible oyster *(Crassostrea madrasensis)* peptide-based nutraceutical, OPex, a 100% natural blend of oyster peptides and oyster protein concentrate has been developed. The

product is a very good source of micro-elements and is useful in the treatment of joint pains and inflammation.

- Developed two functional food products viz., seaweed nutraceutical drink rich in Fucoidan, and Fucoidan enriched fish soup powder from brown seaweed in order to utilize the vast seaweed resources of India. These products have high potential in beverage and packaged food industry.
- HACCP based procedure and software for different fish and fishery products developed for use in fish processing industries. This software was popularized commercially.
- Designs were developed for hygienic fish markets and transferred to NFDB.
- The effluent treatment plant (ETP) designed and developed by CIFT has been adopted by number of seafood processing establishments across the country. For an industry consuming enormous quantity of water this innovative design, ensuring disinfection and clarification of the effluent is going to be a big boon.
- A method for the preparation of good quality cattle/piggery/poultry feed supplement by ensiling fishery waste was popularized. This has solved the environmental problem caused by the decaying waste by converting it into a useful product of high nutritive value and an agreeable smell.
- Rapid diagnosis of disease infections in shrimp post larvae in hatcheries and grow out farms viz., early detection of WSSV in *P. monodon,* White Spot Disease Baculo virus (WSBV), non-radioactive Dot Blot method for detection of white spot syndrome virus etc were developed and were made available to farmers free of cost.
- A sophisticated fish tunnel dryer using solar energy, with LPG/electrical back up for operations during monsoon season, was developed. This model is being popularized in collaboration with MPEDA.
- Developed post-harvest activity clusters and self-help groups of fisherwomen/fishermen were formed for starting rural production units and marketing of products in Kerala, Tamil Nadu and Gujarat.
- Developed portable women friendly kiosks for vending fresh fish, fish snacks and dried fish. These innovative light weight and portable women-friendly vending stations for marketing fresh fish and dry fish deployed are environment friendly and for hygienic street vending of fish
- The role of women in fisheries was evaluated and their contribution to the annual income of the family assessed by an extensive survey in different parts of the country including the NEH. The role of fishermen organizations in the development of small-scale fisheries was also studied along with this.

അനുബന്ധം - 2

Courses

CUSAT

1. Under School of Industrial Fisheries
   MSc Industrial Fisheries
   MFSc SeaFood safety and Trade

2. Under Department of Atmospheric Science
   MSc Meteriology
   MTech Atmospheric Science

3. Department of Chemical Oceanography
   MSc Hydro chemistry
   MPhil Marine Chemistry

4. Department of Marine Biology
   MSc Marine Biology
   MPhil Life Science

5. Department of Marine Geology and Geophysics
   MSc Marine Geology
   MSc Geo Marine Physics

6. Department of Physical Oceanography
   MSc Oceanography
   MTech Ocean Technology

7. National Centre for Aquatic Animal Health
   MTech Marine Bio Technology

CIFNET

Courses offered (Regulalr Courses)
VESSEL NAVIGATOR (VNC) & MARINE FITTER (MFC)

The Institute has been conducting two trade courses viz. Vessel Navigator & Marine Fitter Course of 2 years duration, which is formulated under Craftsman Training scheme of NCVT, New Delhi since 2006. These two trades are started with the view of producing practical Trades man in the Marine Sector and manpower for the Deck side and Engine side of the fishing vessel.

Bachelor of Fishery Science (Nautical Science) course (B.F.Sc. (N.S))

The B.F.Sc.(N.S.) course offered by CIFNET is a 4-year (8 Semester) programme mainly concerned with study of fish capturing techniques, nautical science and operation of fishing vessels. This programme has an exhaustive curriculum designed to provide profound practical knowledge on various aspects of the fishing and nautical sciences. This Degree course is affiliated to Cochin University of Science and Technology, Kochi.

CMFRI

COURSE(S) OFFERED BY CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

1 . Agricultural Research

2. M.Sc. Mariculture

Eligibility B.Sc in Zoology, Botany, Chemistry with Zoology or Botany as subsidiary or Biochemistry with Zoology and Botany subsidary or an equivalent with atleast 55% marks Duration 2 years (4 semesters)

3 . Master of Fishery Science

Eligibility Bachelor's Degree in Fisheries Science (B.F.SC.)

under 10+2+4 system

Duration 2 years

4 . Ph.D. Fishery Science

Eligibility-M.F. Sc.4 years. B. F. Sc. +2years P.G / 3 years B.Sc. + 3years P.G. pattern/ M.Sc. offered at CIFE (Up to 1995) (or) D.F.Sc. Provided candidates HOLD A Bachelor's degree in Biological Science and has two years of experience in äsheries development work after obtaining D.F. Sc. In case of sponsored candidates, those holding M.Sc. in Fish and Fisheries , and related disciplines with at least two years experience in äsheries development work are also eligible to apply

KUFOS

PRE-REGISTRATION APPLICATION FORM

COURSES AND SEATS AT A GLANCE

Sl. No.	School	Discipline	Seats		
			KUFOS	ICAR	Total
1.	School of Aquaculture and Biotechnology	M.F.Sc. Aquaculture	6	2	8
		M.F.Sc Fish Nutrition and Feed Technology	4	1	5
		M.F.Sc Aquatic Animal Health Management	6	2	8
		M.F.Sc. Fish Genetics and Breeding	4	1	5
		M.F.Sc. Fish Biotechnology	4	1	5
2.	School of Fisheries Resource Management and Harvest Technology	M.F.Sc Fisheries Resource Management	6	2	8
		M.F.Sc Aquatic Environment Management	6	2	8
		M.F.Sc Fisheries Engineering and Technology	4	1	5
3.	School of Aquatic Food Products and Technology	M.F.Sc. Fish Processing Technology	6	2	8
4.	School of Management and Entrepreneurship	M.F.Sc. Fisheries Economics	4	1	5
		M.F.Sc Fisheries Extension	4	1	5
		MBA* Finance Marketing/ Human Resource Management/ Rural Management / Fisheries Business Management			35
		M.B.A.* Energy Management			25
		M.Sc. Statistics			10
		LL.M. Maritime law			20
5.	School of Ocean Science and Technology	M.Sc. Biological Oceanography and Biodiversity			25
		M.Sc. Physical Oceanography and Ocean Modeling			10
		M.Sc. Food Science and Technology			25
		M.Sc. Biotechnology and Bio-informatics			15
		M.Sc. Algal biology and Marine Drugs			20
		M.Sc. Marine Chemistry			15
6.	School of Fishery Environment	M.Sc. Climate Science			10
		M.Sc. Environmental Sciences			15
		M.Sc. Disaster Management			10
7.	School of Ocean Engineering and Underwater Technology	M.Sc. Ocean Remote Sensing and GIS			10
		M.Sc. Applied Geo Sciences			10
		M.Tech. in Integrated Coastal Zone Management			6
		M.Tech. in Ocean and Coastal Safety Engineering			10
		M.Tech. in Coastal and Harbour Engineering			10
		M.Tech. in Fisheries Engineering			6